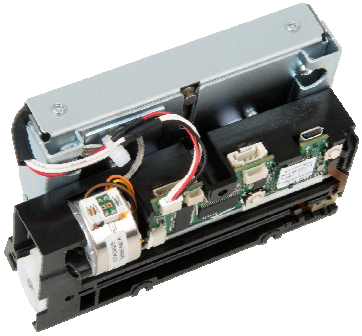
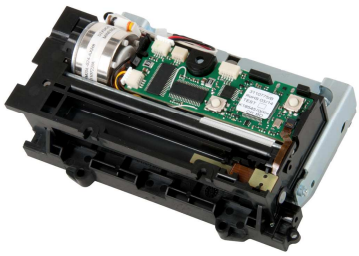
THERMAL PRINTER COMPONENTS

TRITON 80 SERIES
80 mm KIOSK

USER MANUAL

Reference: 31 10 906
September 2014





EVOLUTIONS

Date	Issue	Modifications
4/7/14	A	
17/09/14	B	Update on voltage range (page 7)

IMPORTANT

This manual contains the basic operations for running your printer.

Read it carefully before using your printer.

Pay special attention to the chapter “Recommendations”.

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1 UNPACKING

Each printer kiosk is packaged in an antistatic bag.
Observe precautions while handling against electrostatic discharges.

2 OVERVIEW

Based on direct thermal printing technology, the TRITON series is a range of highly reliable printer kiosk devices that has been specially designed to fit in minimum space.

Main characteristics:

- Very small size printer and cutter
- Silent print mechanism
- Integrated controller board with USB and RS232 interfaces
- Available in 12 or 24V power supply
- Available with and without paper arm
- Available with and without paper low sensor
- Available with presenter and without

SUMMARY OF PRINTER SPECIFICATIONS

ITEM	VALUE	UNITS
Printing method	Static thermal dot line printing	-
Printing width max	80	mm
Printing speed max (1) - 24V - 12V	 250 150	mm/sec
Paper loading	Auto-load and Clamshell	-
Paper width	60/80/82.5	mm
Maximum paper thickness	60 to 120 Option up to 190	µm
Recommended paper	JUJO AF50KSE3	
Number of resistor dots	640	-
Resolution	8	dots/mm
Number of steps / dot line	1	-
Paper feed / dot line	0.125	mm
Head temperature detection	By Thermistor	-
Out of paper detection	Opto-sensor	-
Maximum duty cycle Ton / Toff (*to avoid motor temperature rise*)	15% max at 25°C (see chapter Printing recommendations)	%

(1) Max print speed will depend on paper reference, power supply, dots ON ratio and paper roll dampener system.

SUMMARY OF PRINTER SPECIFICATIONS (continued)

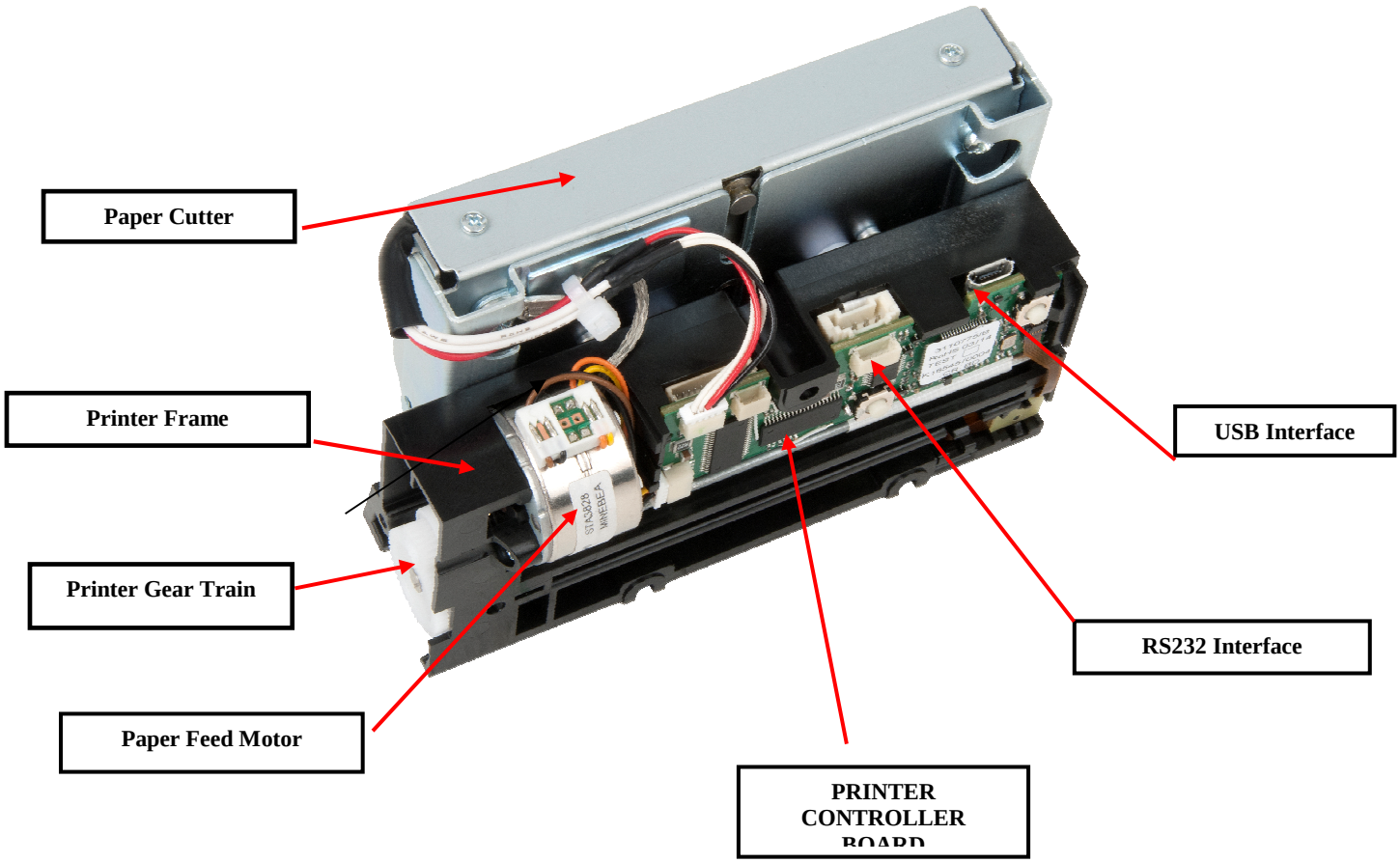
ITEM	VALUE	UNITS
Storage temperature range	- 40 to + 70	°C
Operating temperature range	- 20 to + 60	°C
Relative humidity range (*operating*)	20 to 85 *no condensing*	%
Operating voltage range Vch (*dot*)	12 volt version: 10.0 – 13.8 24 volt version: 20.6 – 25.2	V DC V DC
Electrical life time	10E8	pulses
Mechanical life time	100 Km	Km
Cutter life time	1 500 000 cuts with recommended paper	-
Over all dimensions (HxWxD) (wo paper roll)	47.5 x 117.6 x 69.	mm
Weight (*average*) (*without paper roll*)	390	g

3 KIOSK SPECIFICATIONS WITHOUT PRESENTER

3.1 General description

The thermal printer consists mainly in:

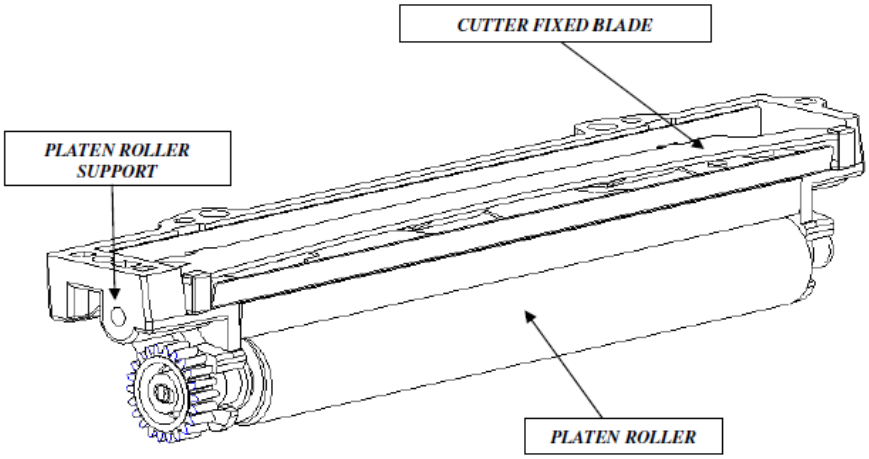
- Thermal mechanism
- Robust guillotine cutter
- Controller board with USB and RS232 interfaces

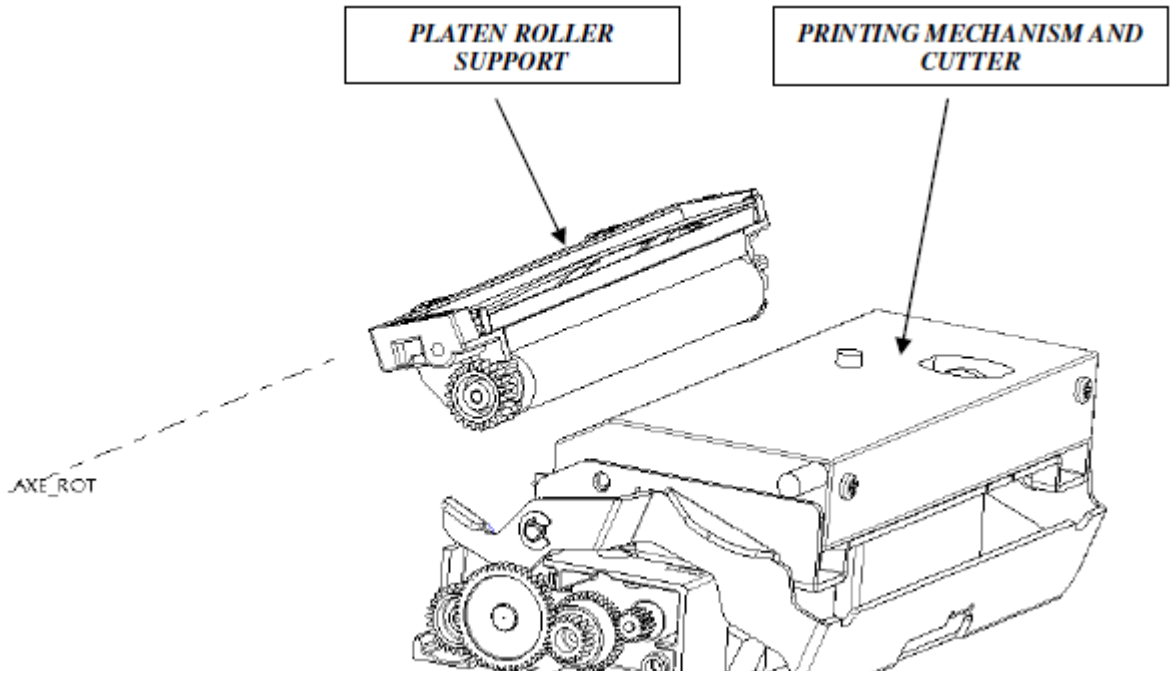


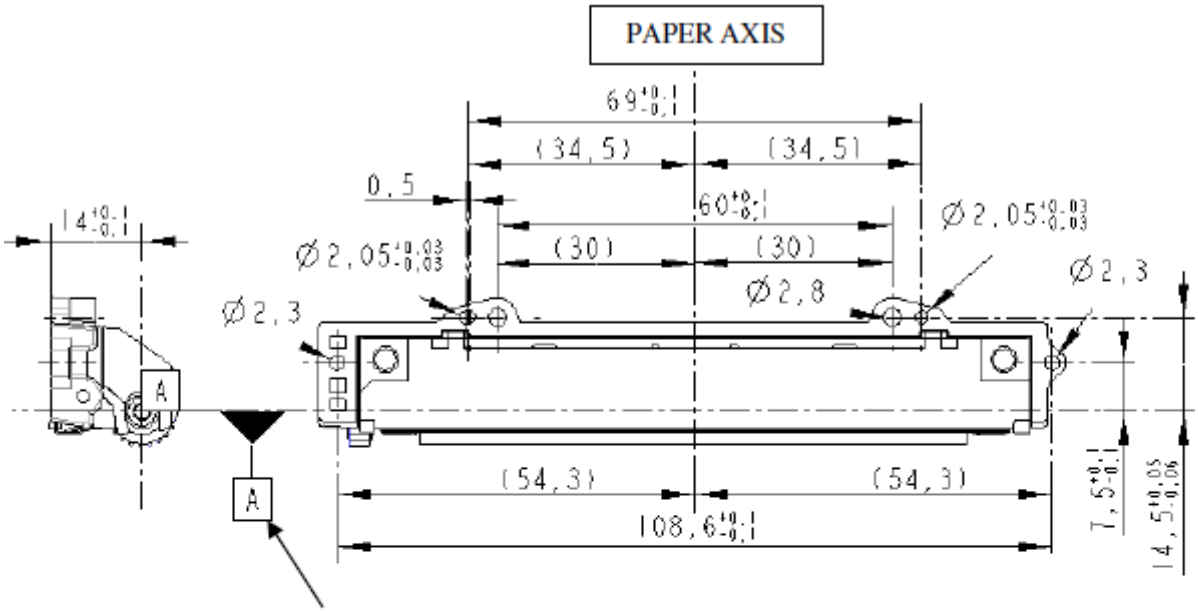
3.2 Mechanical views

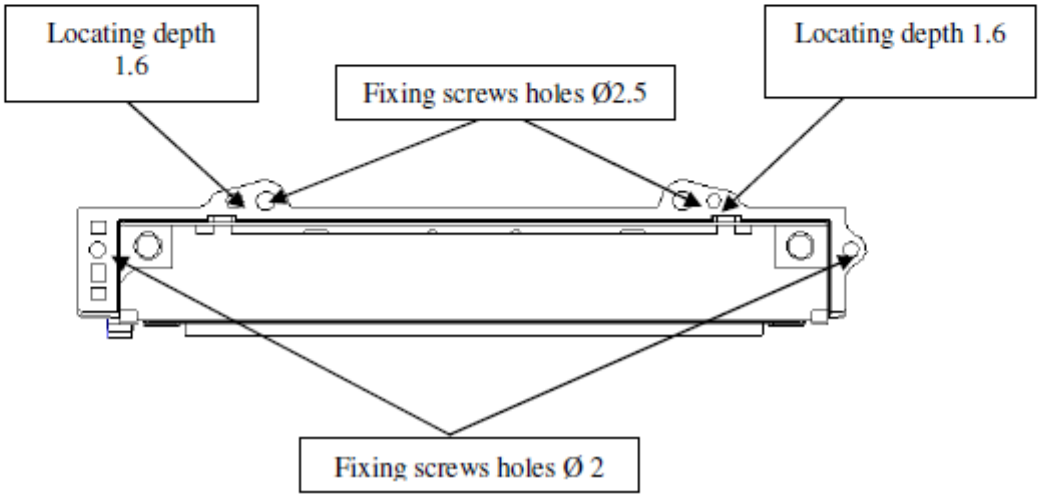
3.2.1 Clamshell Version

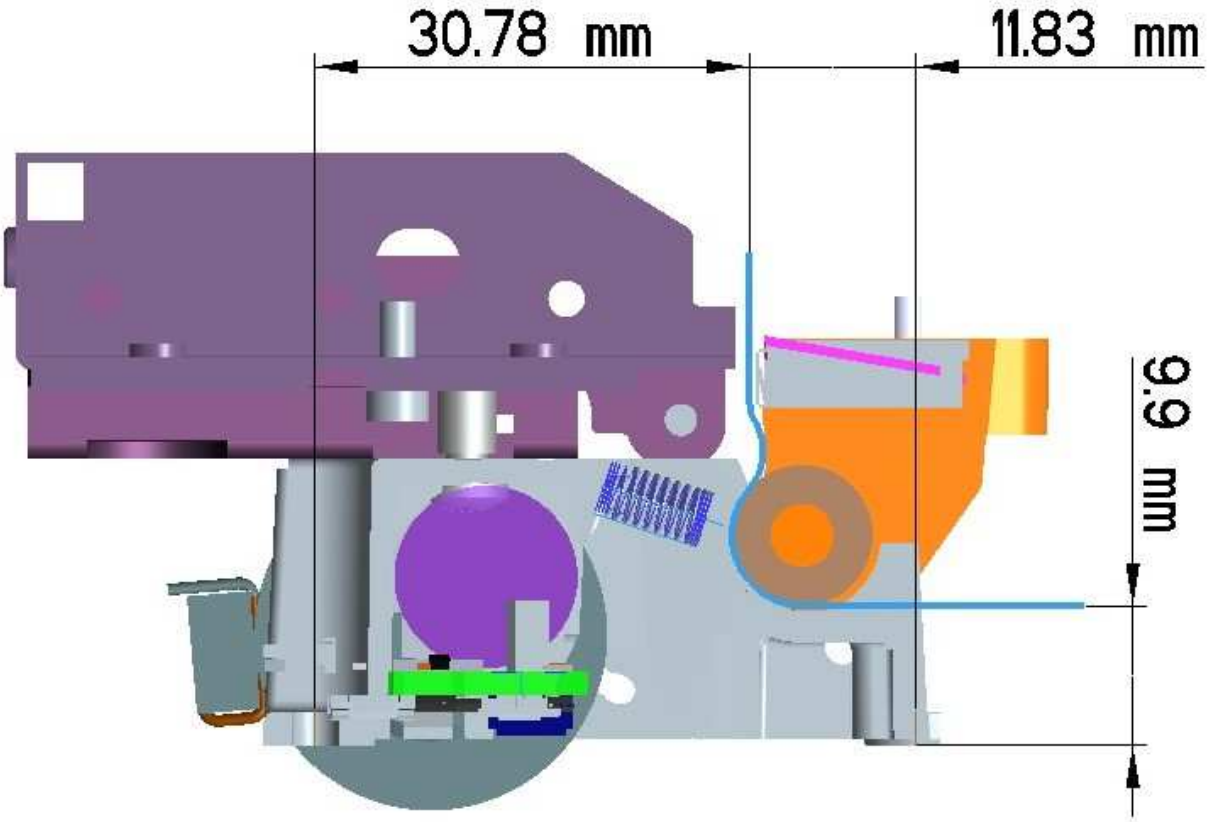
The platen roller and fixed cutter blade are positioned in the printer cover so the paper path is free to position the paper when the cover opens.



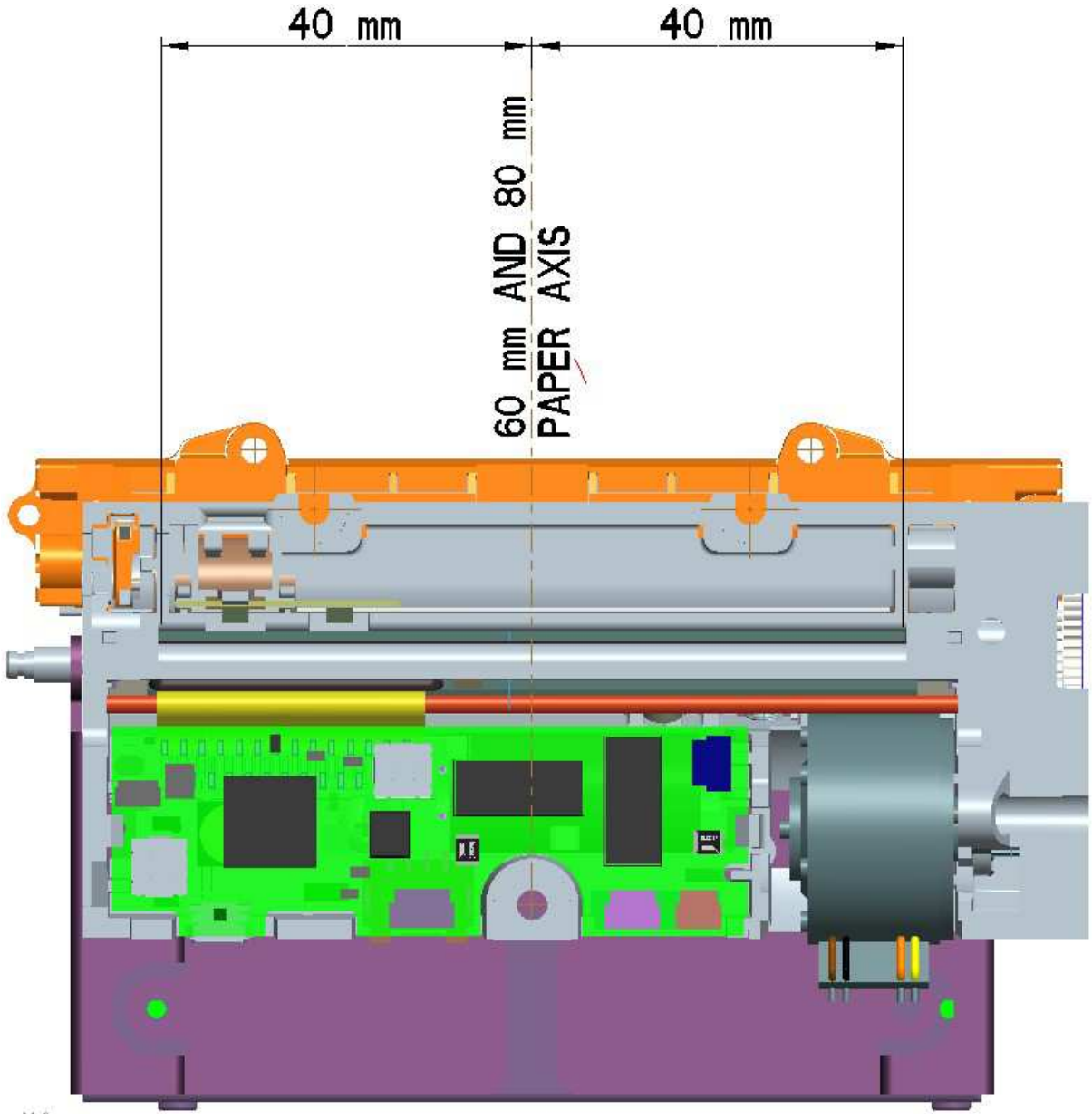



PAPER AXIS
69
(34,5)
(34,5)
0,5
60
(30)
(30)
Ø2,8
Ø2,3
Ø2,3
Ø2,3
14
A
A
(54,3)
(54,3)
108,6
7,5
14,5

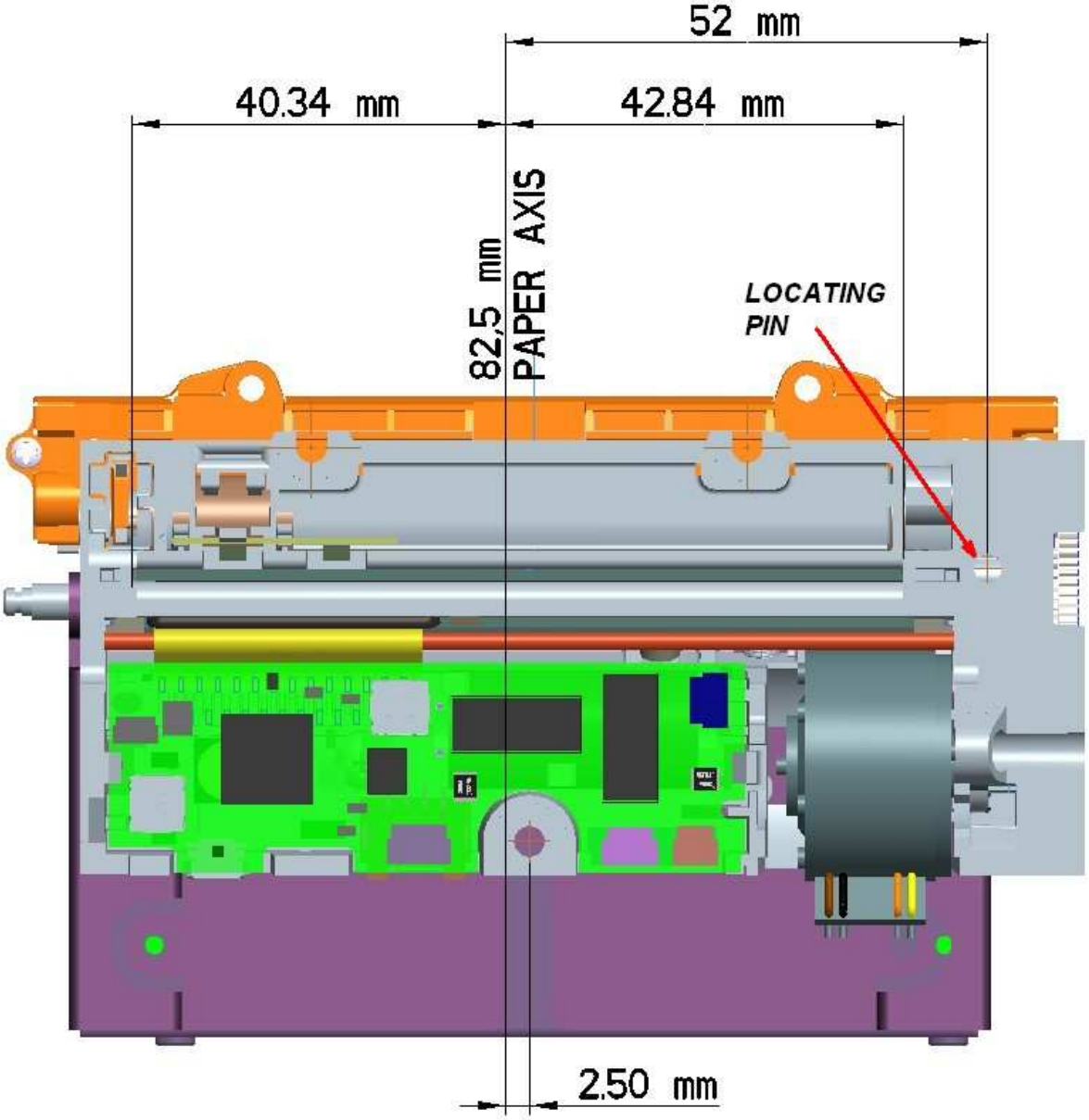

Locating depth 1.6
Fixing screws holes Ø2.5
Locating depth 1.6
Fixing screws holes Ø 2



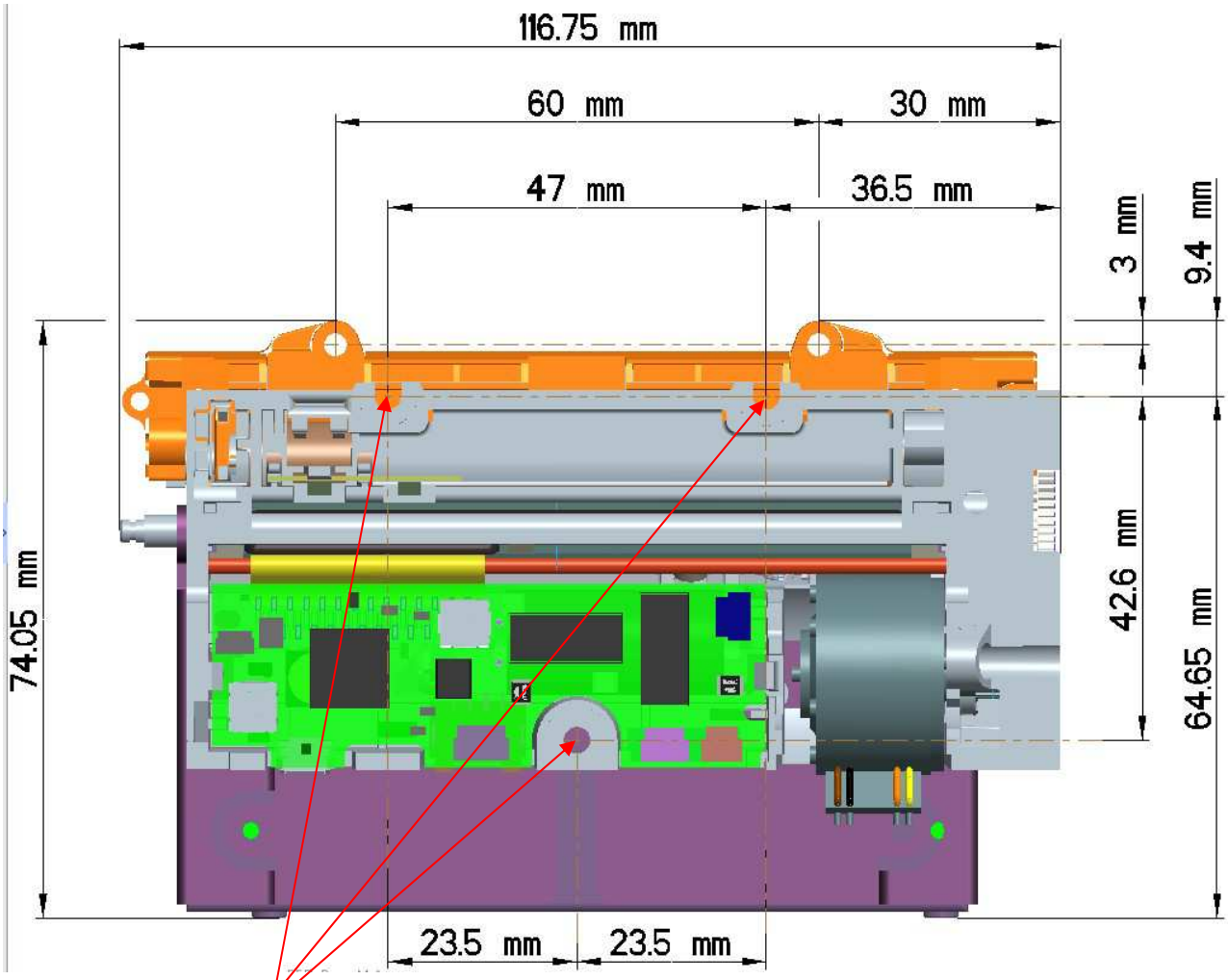
Paper path for clamshell version.



60 and 80mm Paper Path.

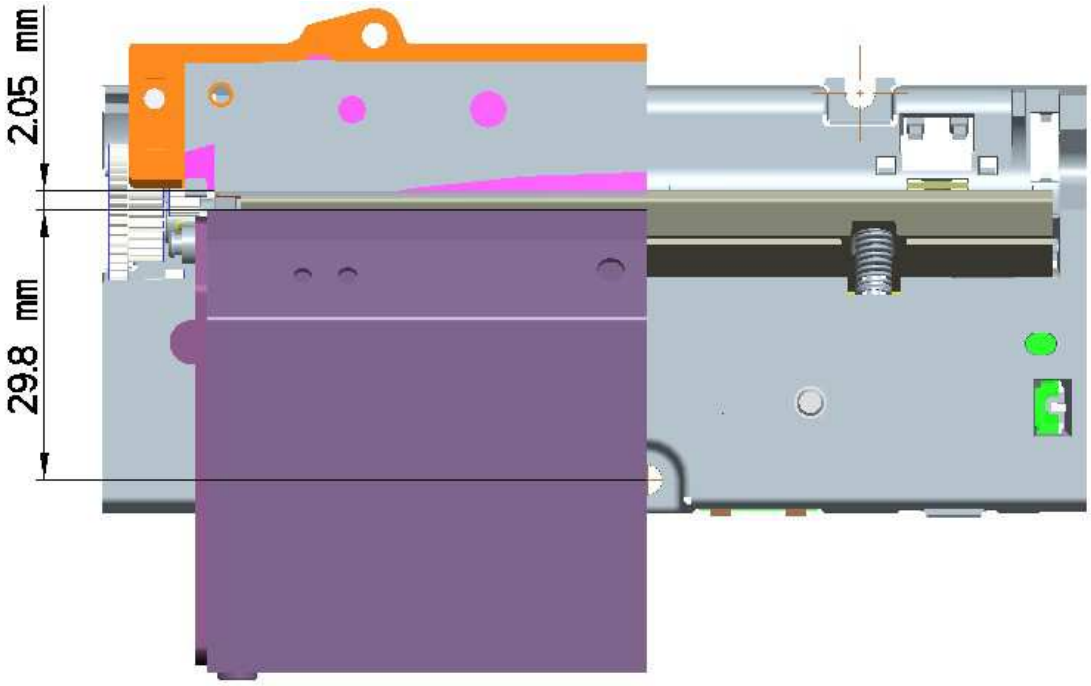


82.5mm Paper path.



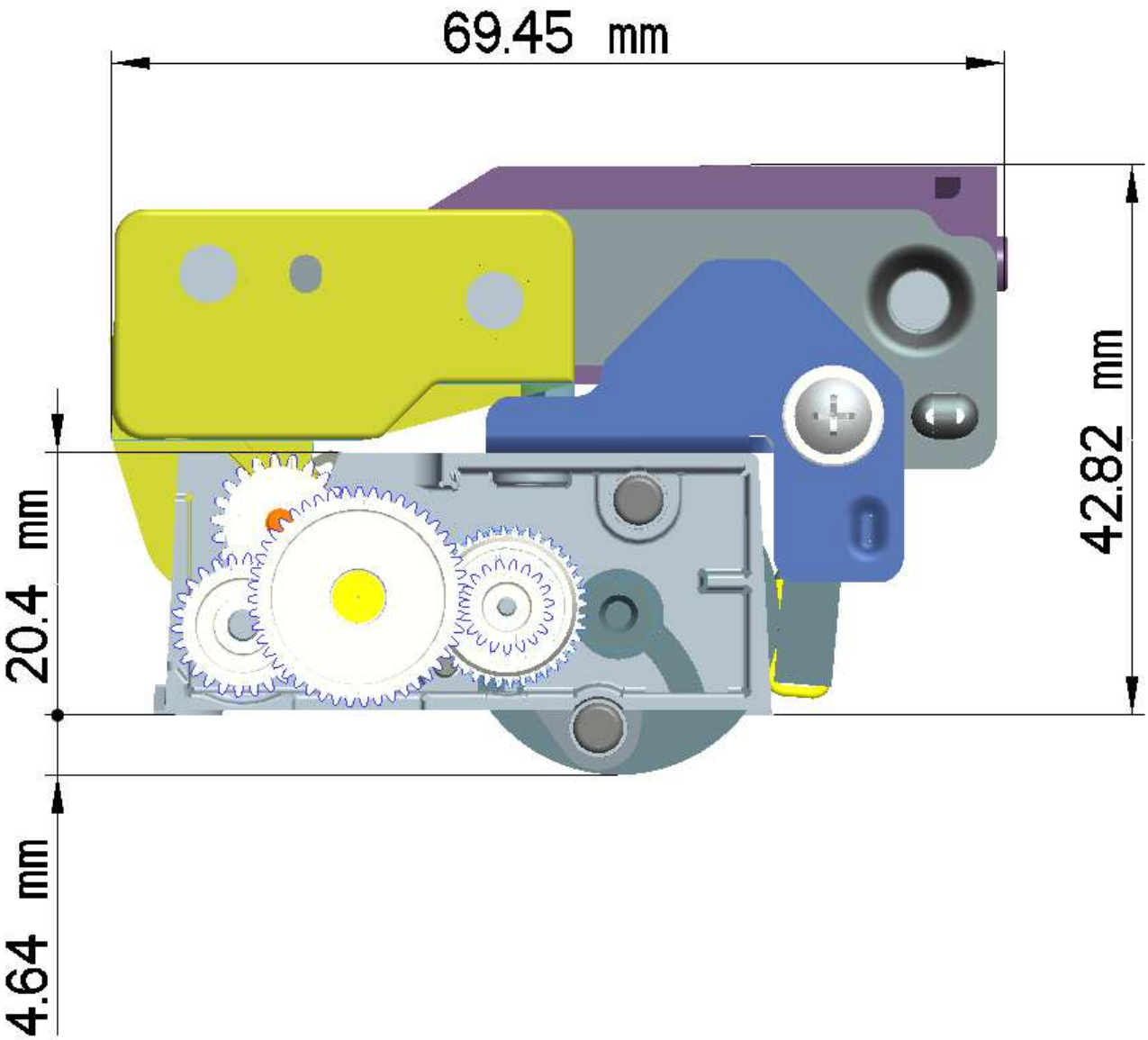
Fixation by 3 screws dia 3.0mm

Position of fixation points. Use screws diameter 3mm with 0.3 N.m fixation torque.

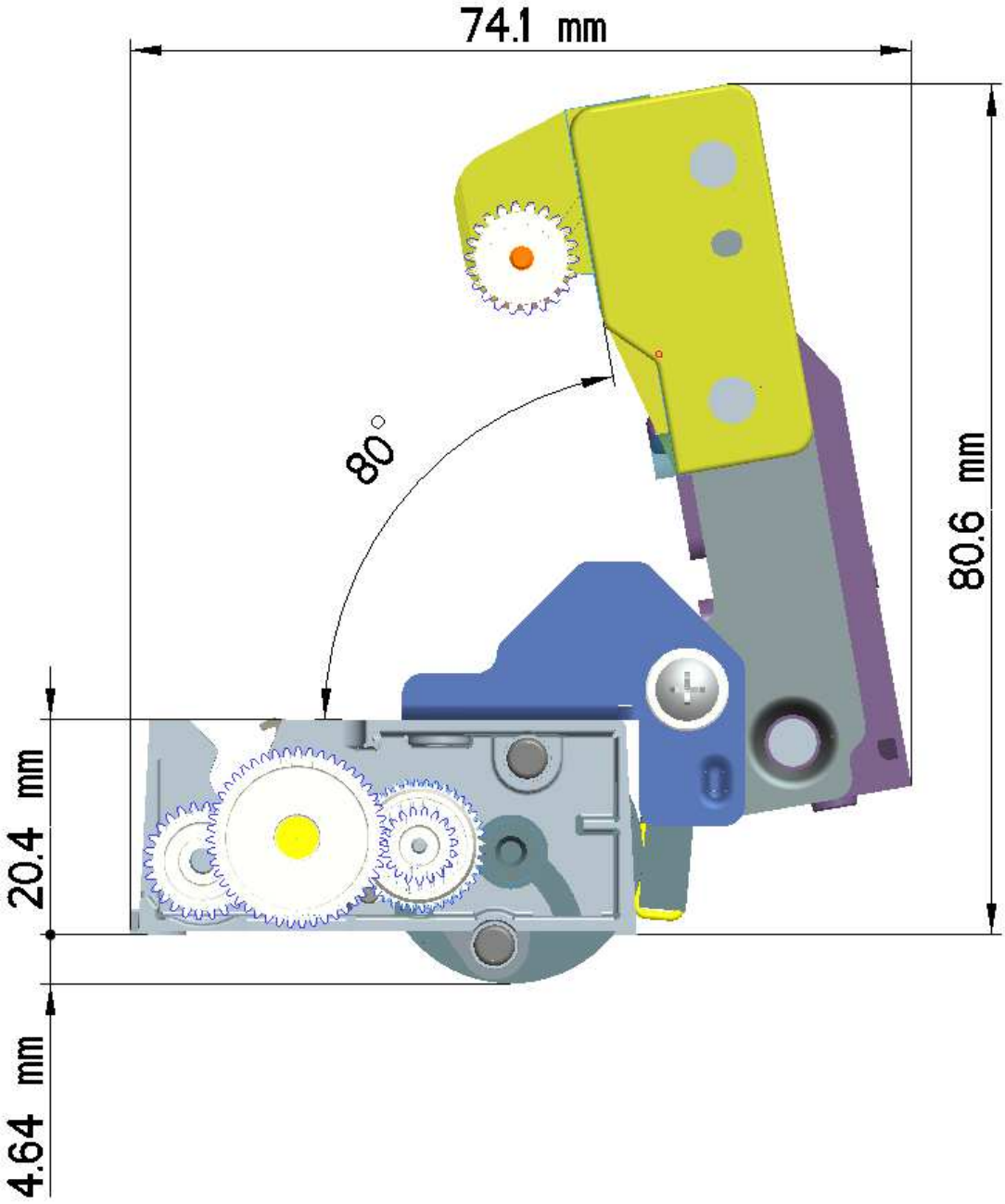


Paper exit path for clamshell version.

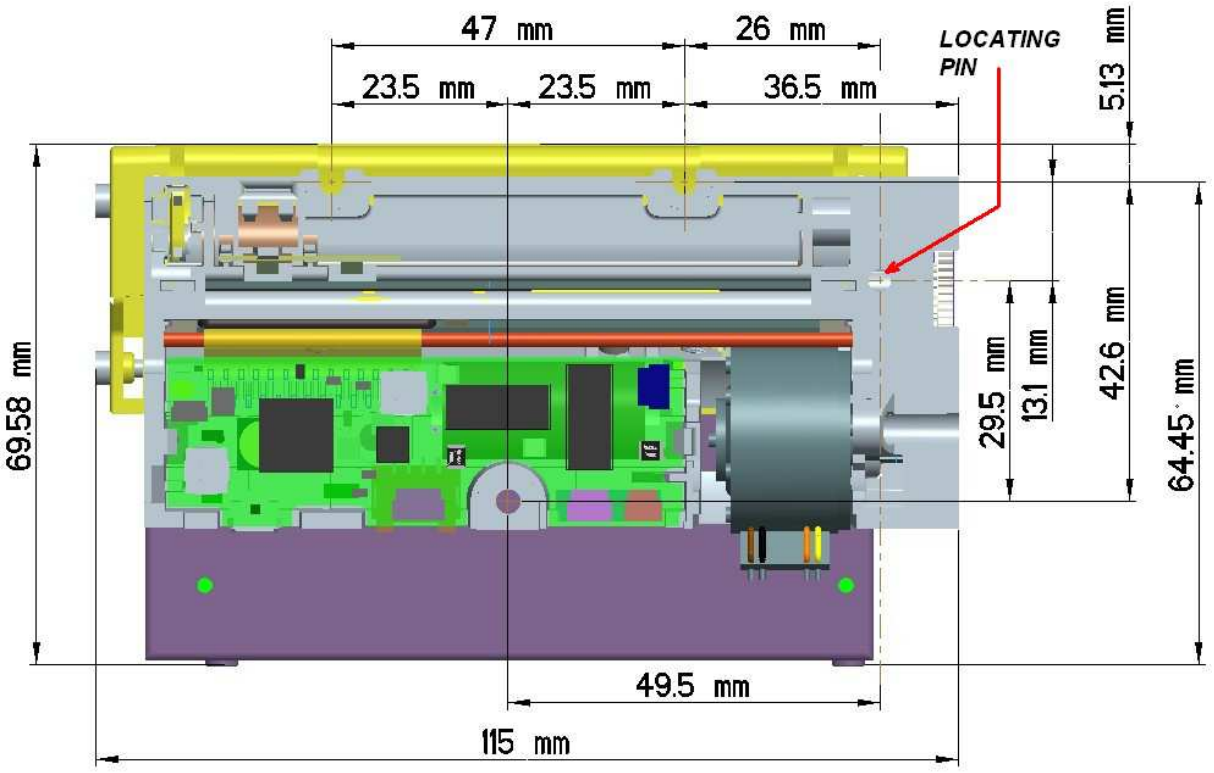
3.2.2 Autoload Version

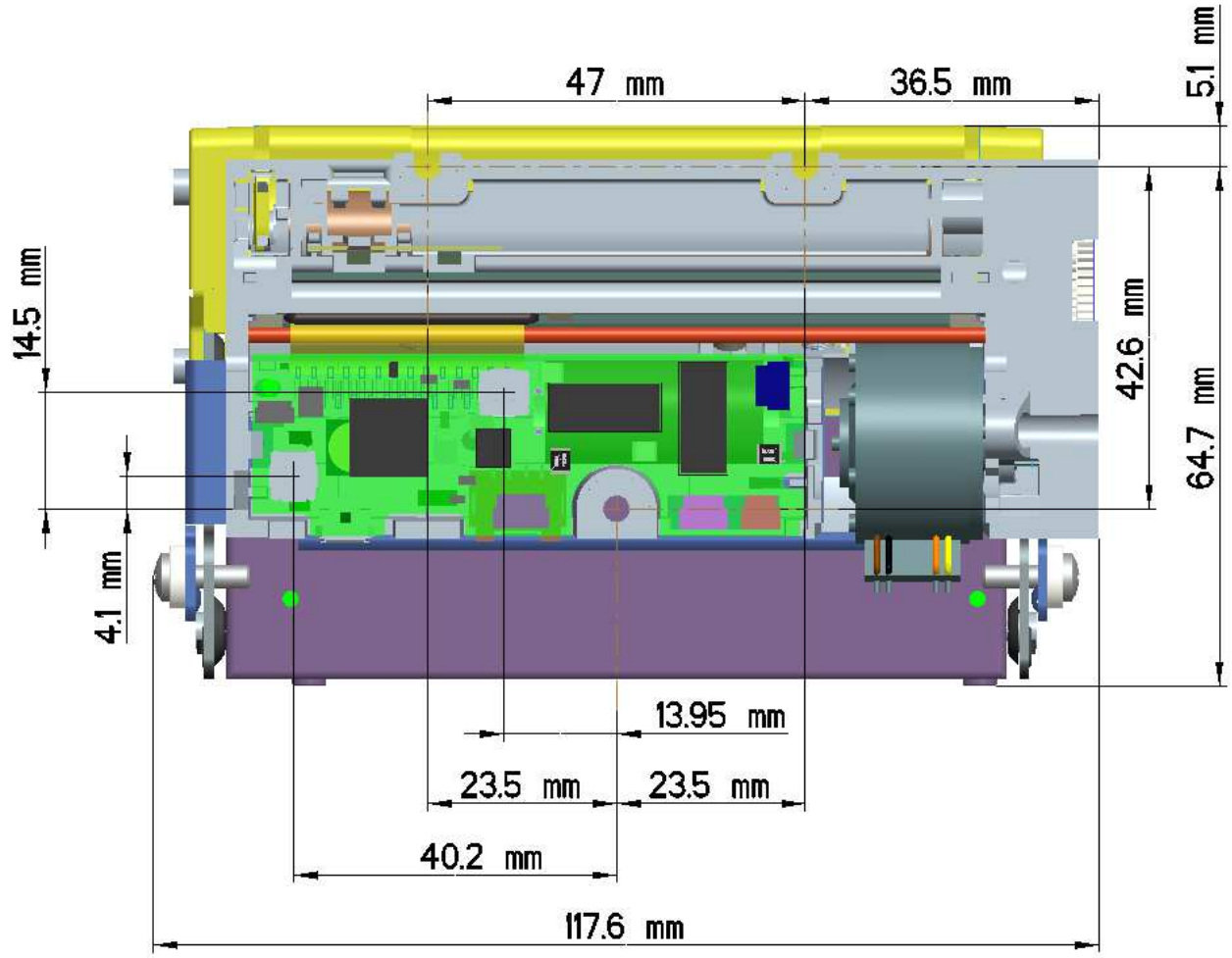


Autoload, side view

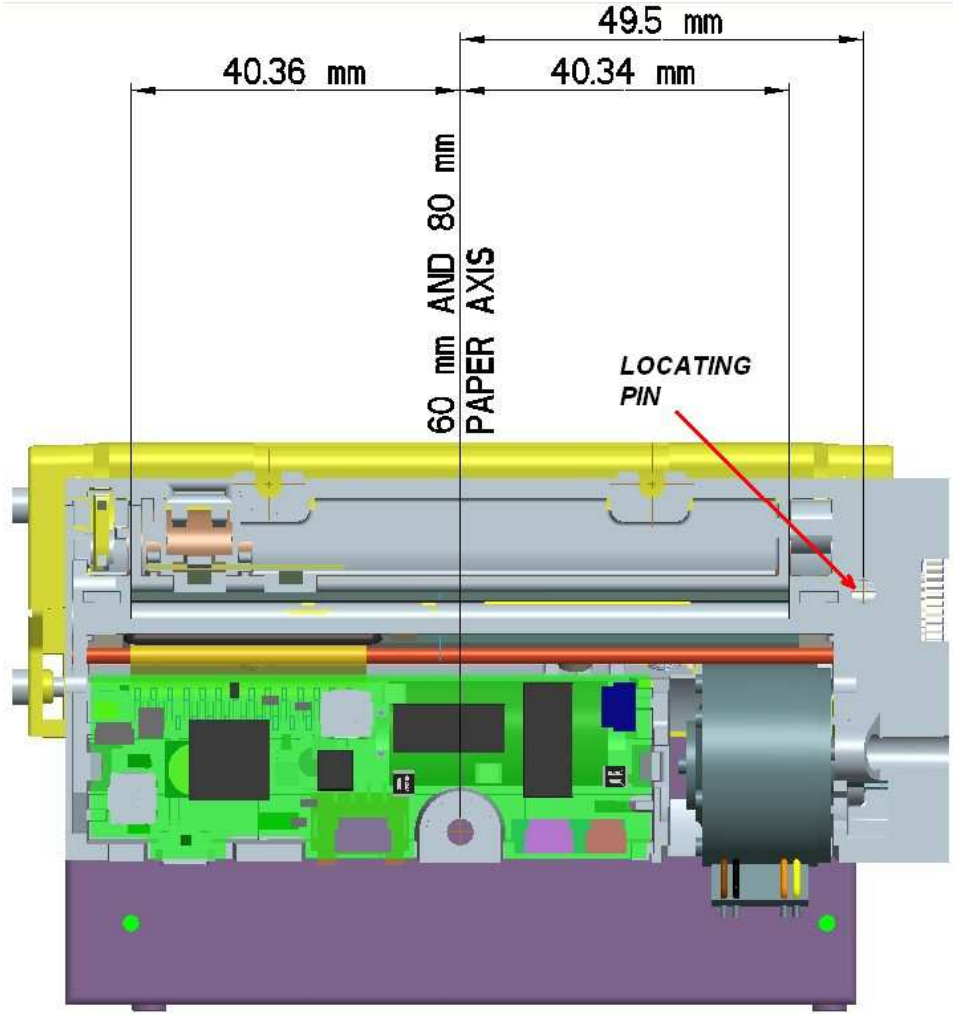


Cover in Open position

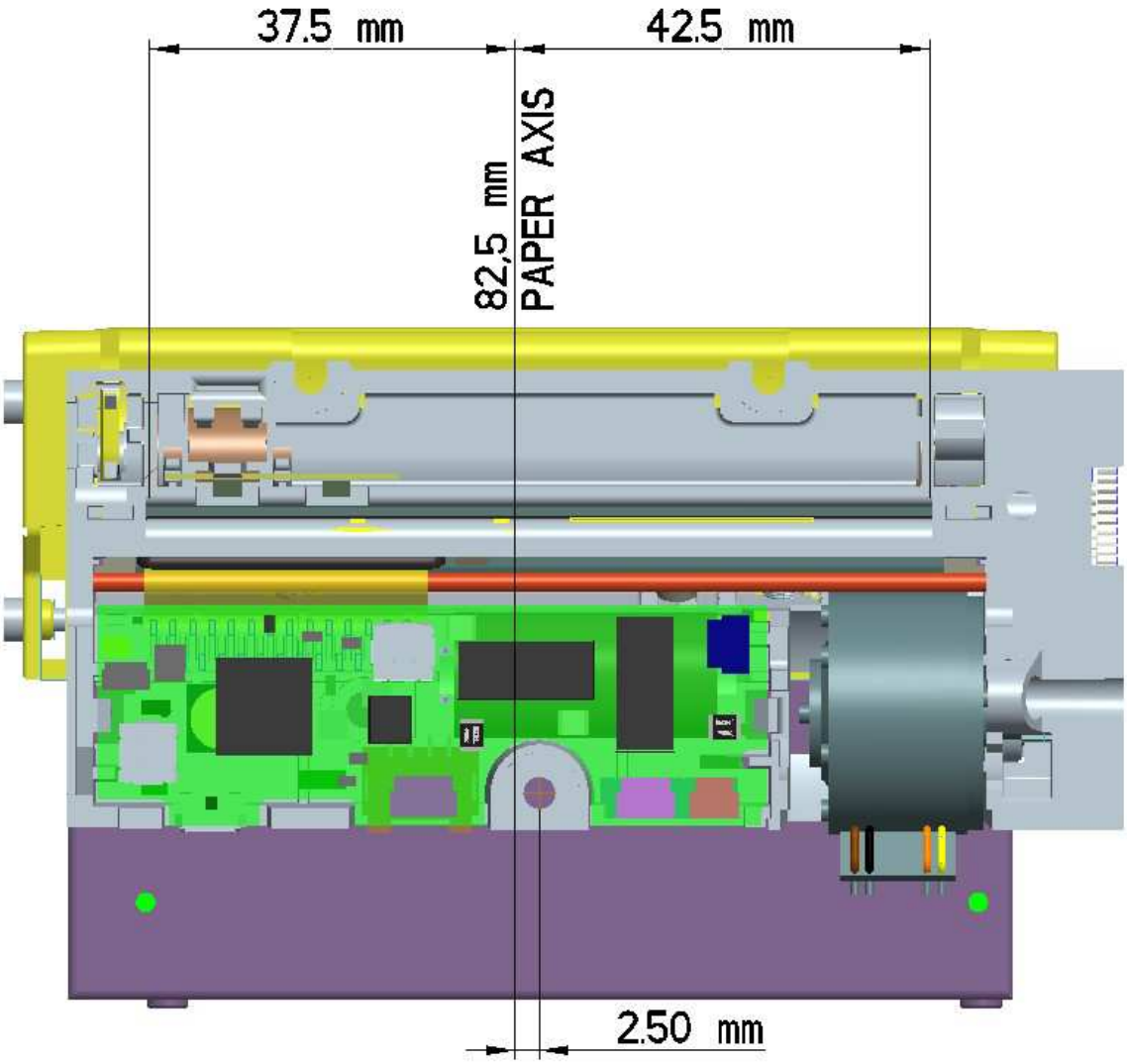




Position of fixation points and buttons.

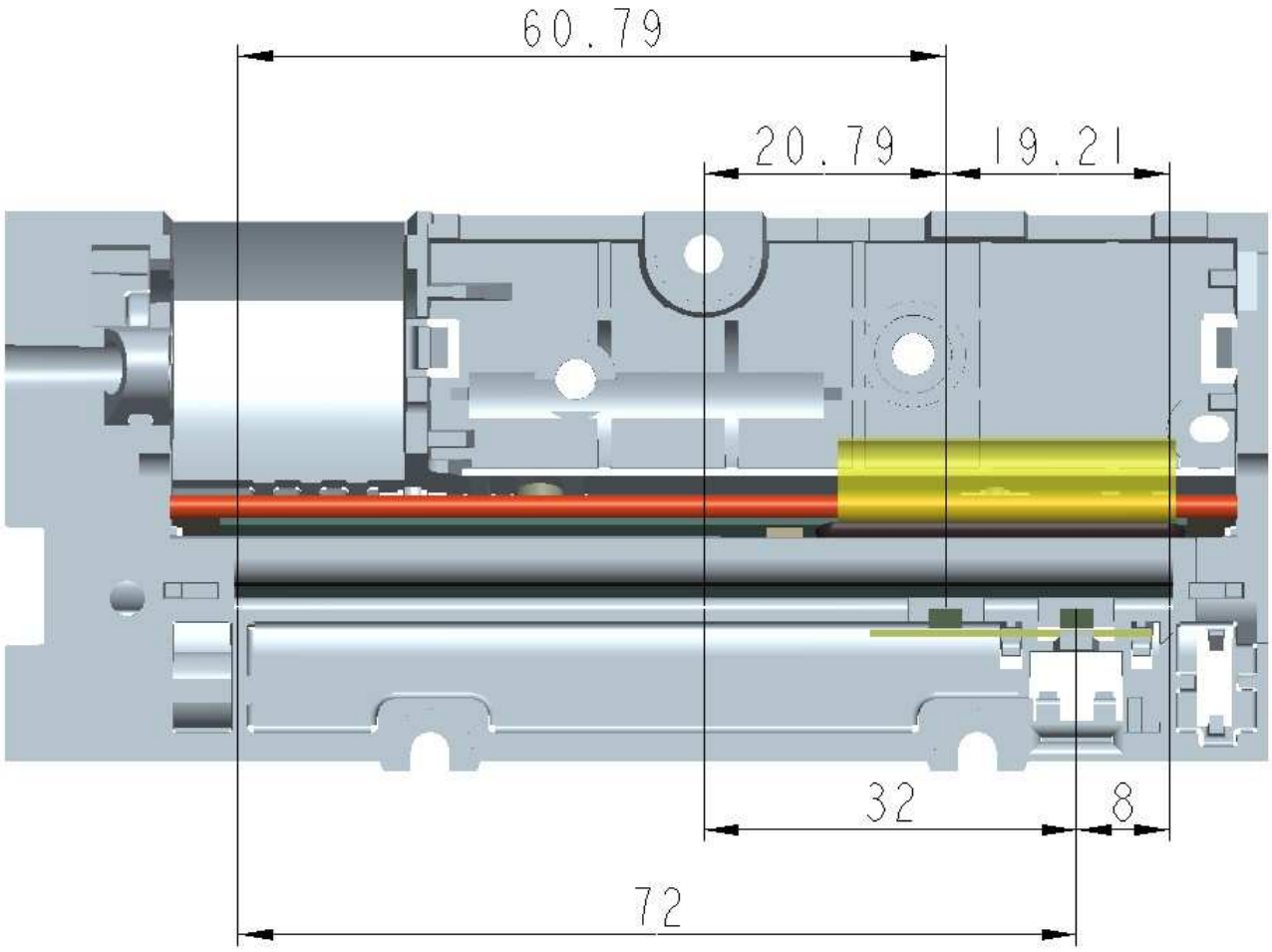


Position of 60 and 80mm paper path and location pin.

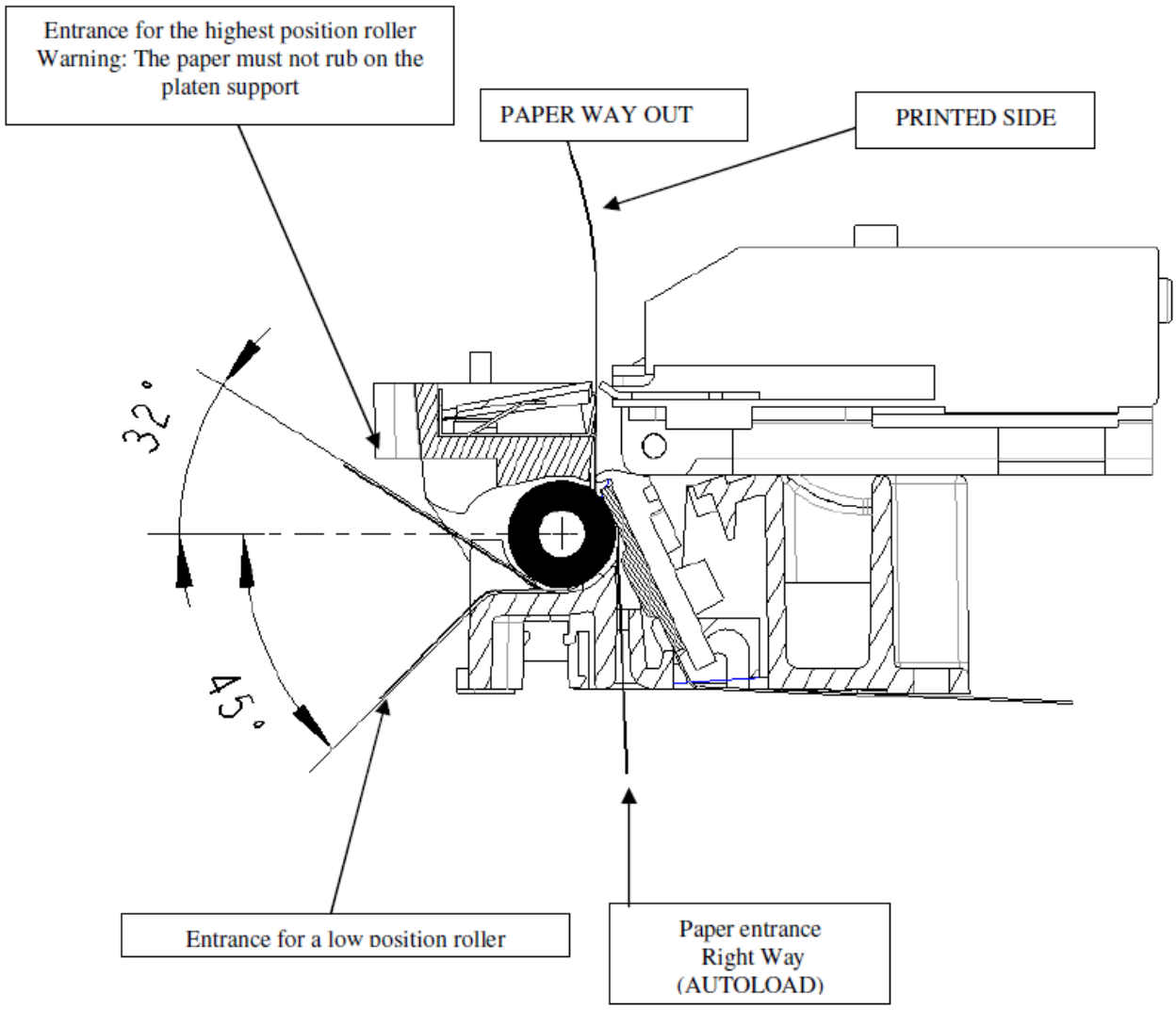


Position of 82.5mm paper path.

3.2.3 General mechanical information



Position printhead dots versus the paper detection sensors


Entrance for the highest position roller
Warning: The paper must not rub on the platen support
PAPER WAY OUT
PRINTED SIDE
32°
45°
Entrance for a low position roller
Paper entrance
Right Way
(AUTOLOAD)

Paper paths

4 ELECTRICAL SPECIFICATIONS

4.1 ESD discharge recommendation

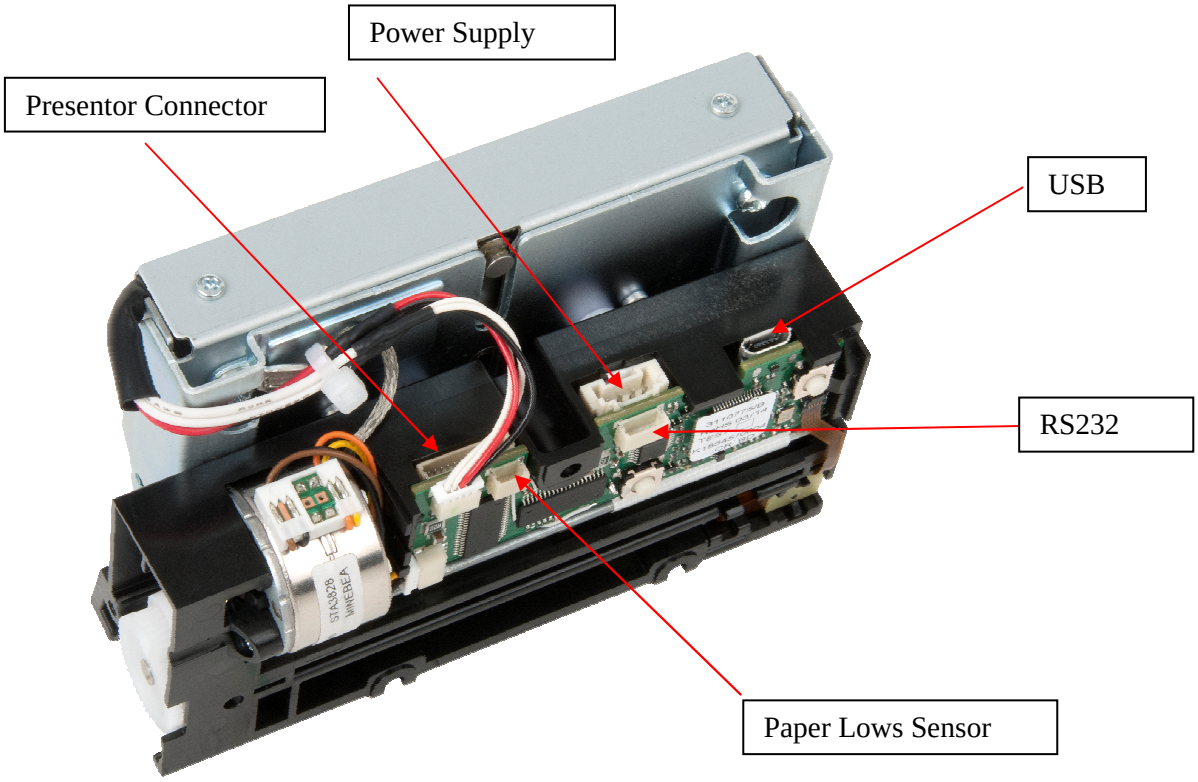
Due to high speed printing resulting in electro-static accumulation, it's very important to connect the grounding to avoid ESD damage. This must be done by connecting the ground cable of the mechanism to a ground connexion.

4.2 Nominal Power supply and Consumption

	Voltage Range	Current	Units
12V Version	**10.0 to 13.8**	**25A max (1ms) (all dots On in same time)**	**V DC**
24V Version	**20.6 to 25.2**	**22A max (1ms) (all dots On in same time)**	**V DC**

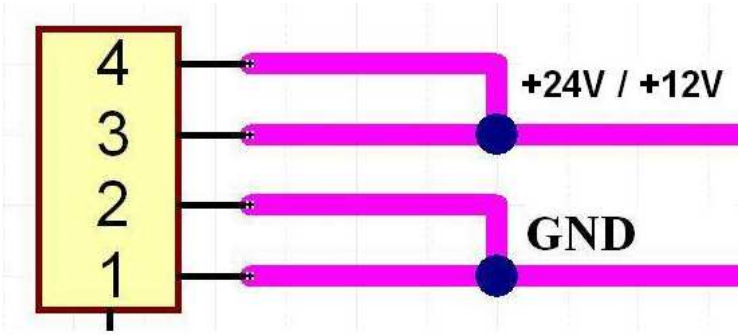
A minimum 75W power supply is recommended.

4.3 TRITON 80 connectors



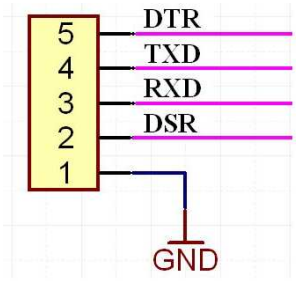
Back view of connectors

J 10 POWER SUPPLY: Power cable connector (4 pin straight connector).
Female connector reference: **JST PAP-04V-S**

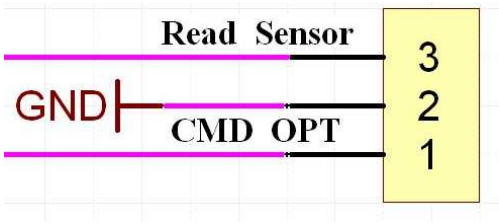


RS232 Interface: RS232 cable connector (5 pin straight connector).

Female connector reference: **JST SHR-05V-S-B**



Additional opto sensor connector: Paper low connector (3 pin straight connector)
Female connector reference: **JST SHR-03V-S-B (**



USB Interface:

The connector is a USB micro-B type.
Pinout and connector are standard USB.

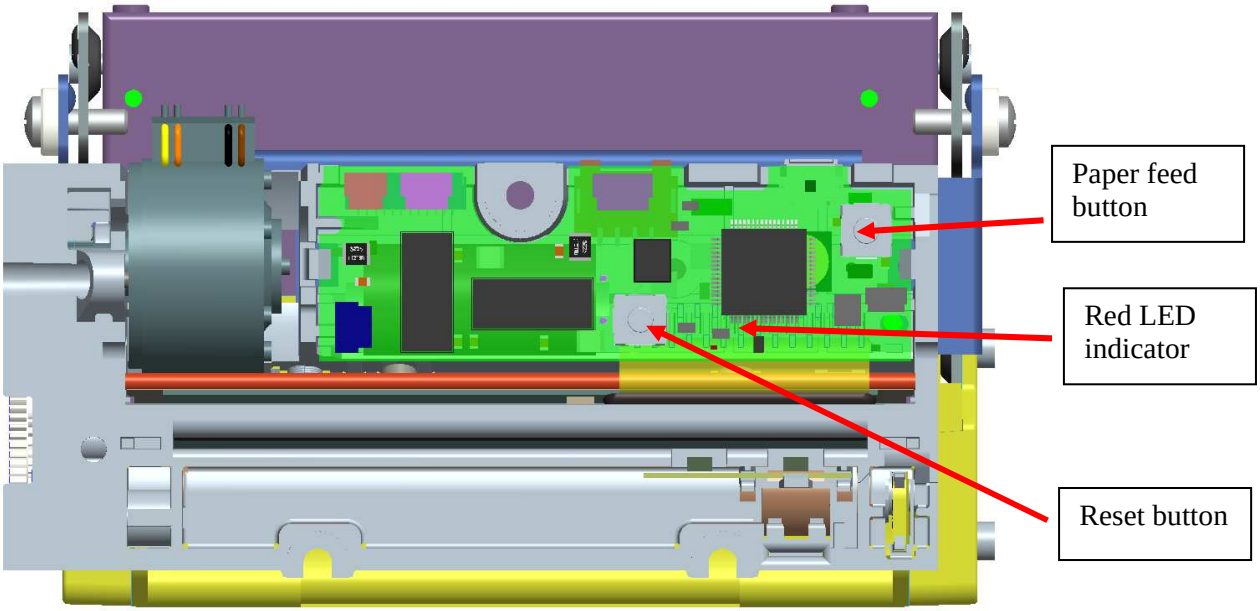
USB cable and connector: MOLEX ref 68784-0001

Pin 1: VUSB
Pin 2: D-
Pin 3: D+
Pin 4: Not Connected
Pin 5: GND

4.4 Printer Buttons and LED

The TRITON series has two interface buttons for paper feeding and reset of printer above the paper inlet.
Paper feeding and resets may also be activated by commands on the RS232 or USB interfaces.

The LED indicator provides information on board status:
1- Continuous red: board is powered and ready to operate
2- Flashing quickly: the firmware is in boot mode
3- Flashing slowly: an error is detected by the board (no paper, out of range voltage etc)



4.5 Duty cycle restrictions (printing solid blocks)

The main cause for duty cycle restriction is paper feed motor temperature increasing due to continuous printing, or Duty cycle too important (see below the allowable).

Warning: if you exceed the duty cycle you will damage the motor and plastic part of the mechanism.

Allowable Duty Cycle Ton / Toff for continuous printing

current	% Dutycycle	comments
700 mA	15	Standard configuration for optimal Speed and Roll diameters

Second cause for duty cycle restriction is the heat generated by the receipt thermal print head when printing solid blocks (regardless of the length of the block in relation to the print line). The restrictions are ambient temperature, the percentage of time (measured against one minute) of continuous solid printing, and the amount of coverage.

Caution: When the duty cycle approaches the limits shown in the table, the receipt print head will heat up. If print head temperature exceeds 65 °C, a safety feature will shut down the print head to prevent damage. Printing will continue after the printhead has cooled.

5 RECOMMENDATIONS

5.1 Recommendations for paper

- Use a paper reference recommended by AXIOHM. Poor quality paper may affect the print head life and the printer performances.

For nominal current (700 mA)

Roll diamètres	Max speed in mm/s
240	120
220	140
210	160
190	160
170	160
150	180
130	180
110	200

- It's possible to increase this performance by reducing shock of roll inertia. (contact Axiohm for more detail)
- Leave the paper stock spool free to turn.
- The printer should not operate without paper as this will damage the surface of the platen.

5.2 General

- Ensure that there is adequate air circulation around the print head support/heat sink as poor ventilation of the print head can degrade the print quality.
- Never open the cover whilst the cutter is operating.
- Never introduce tools inside the printer, wires could be de-soldered or short circuited.
- It is very important that the print head support/heat sink is connected to the customer appliance chassis (see p16 pin out connection GND).
- Ensure that the cutter blades are in the correct position before use in order to ensure that they do not deteriorate.
- When continuous printing is performed, the supply energy should be reduced so that the head temperature monitored through the thermistor will remain below the maximum temperature.
- Heat elements and IC's shall be anti-electrostatic in order to prevent electrostatic destruction. Do not touch the connector pins with fingers.
- Make sure no foreign particles roll on the head surface, this would cause damage.
- If condensation occurs, do not switch on the printer until it has disappeared.

5.3 Cleaning recommendations

The TRITON kiosks are high reliable units which require very little maintenance but may benefit from cleaning as detailed below.
Depending on the environment in which the printer is used, the printer can accumulate dust. Therefore it is necessary to clean it periodically in order to maintain a good print quality. The cleaning period is dependent on the environment and the usage of the printer, but the print head should be cleaned at least once a year or up to one month in heavy duty applications. The print head should always be cleaned immediately if the print becomes visibly fainter due to its contamination.

Cleaning Instructions:

- Switch off printer. **Never clean the head immediately after printing, the head may be hot**.
- Open the printer cover and remove the paper from its slot.
- Clean the heating dots of the head with a cotton swab containing a solvent alcohol (ethanol, methanol, or IPA) but **do not touch the print head with your fingers!**
- Allow the solvent to dry.
- Reload the paper and close cover.

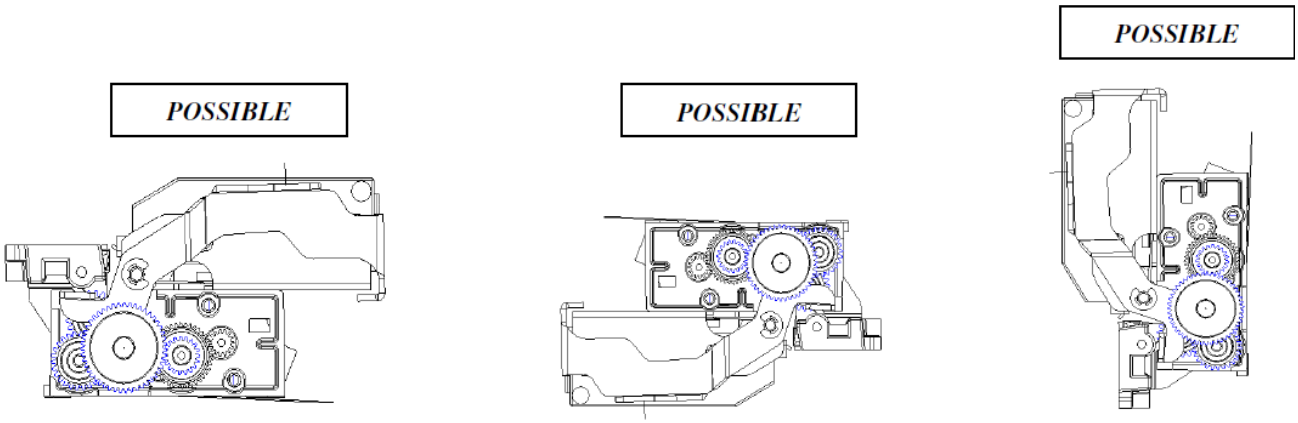
N.B**:** AXIOHM is able to provide cleaning kits**.** Please contact your sales manager.

5.4 Special recommendation for cutter

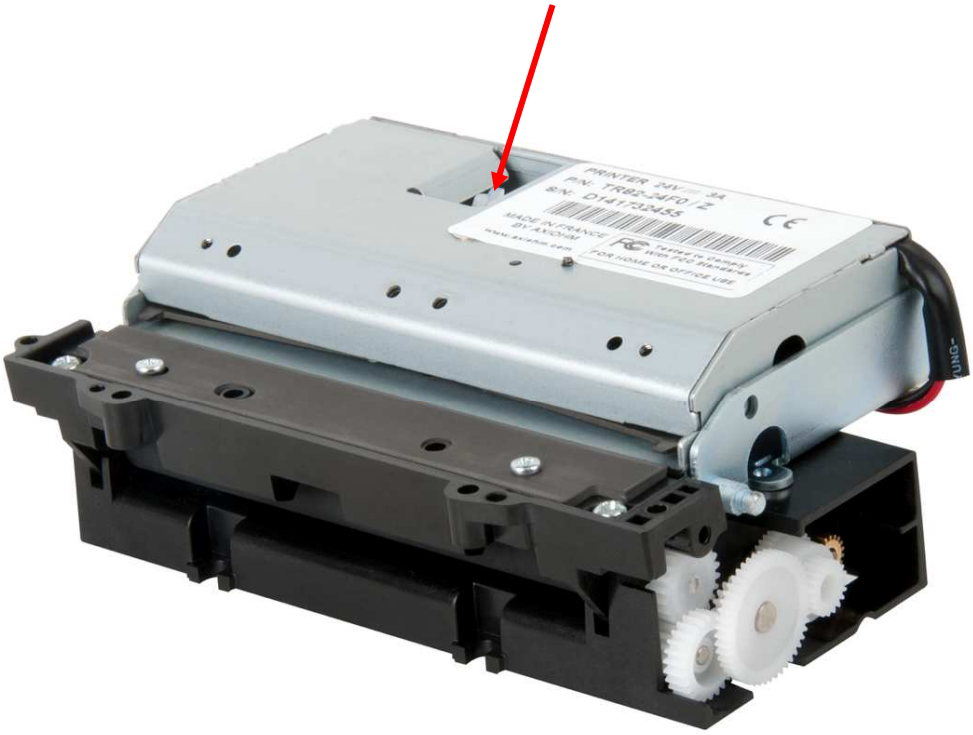
Mechanical stress should not be applied to the cutter cover; it would lead to a blade movement perturbation.

To avoid paper jam, it is recommended to feed paper after cutting (see the command 1f 03 82 n) .

Recommended positions for paper dust elimination are indicated below. For another position please contact Axiohm.



To release blades in case of jam, use the wheel shown on next drawing:



6 GENERAL SPECIFICATIONS

6.1 Features

Communication Interfaces	RS232 / USB 2.0 4kb to 24K reception buffer
Amount of Flash Memory accessible for user storage	**192 kb**
Resident Code Pages	PC Code Pages : CP 437 / CP 737 / CP 850 / CP 852 / CP 858 / CP 860 / CP 862 / CP 863 / CP 865 / CP 866 / CP 1252 / CP 1253
Bar code support (1D and 2D)	Code 39, UPC-A, UPC-E, JAN8 (EAN), JAN13 (EAN), Interleaved 2 of 5, Codabar, Code 128, EAN 128, PDF-417, Code 39, Code 93, QR Code, Datamatrix
Drivers available	Windows 98 / XP /2000/ Vista, Windows CE, Windows 7 (32b & 64b),Linux
Human Interface	LED Reset Button Paper feed button

7 RS232 PARAMETERS

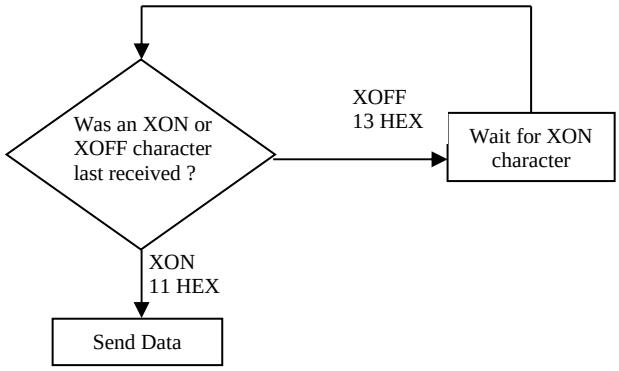
The RS-232C interface uses either XON/XOFF (software) or DTR/DSR (hardware) protocol to control the flow of information between the computer and the printer.

In XON/XOFF mode, a particular character is sent back and forth between the host and the printer to regulate the communication.

In DTR/DSR mode, changes in the DTR/DSR signal on the RS-232C interface controls the information flow.

7.1 XON/XOFF Protocol

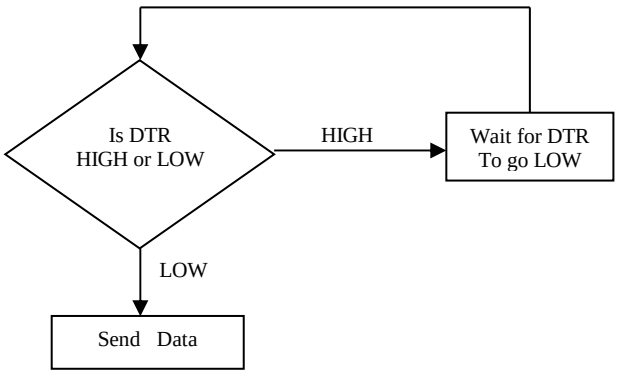
The XON/XOFF characters controls the information transfer between the printer and the host computer. The printer sends an XON character when it is ready to receive data and it sends an XOFF character when it cannot accept any more data.
The software on the host computer must monitor the communication link as shown in the following flowchart in order to send data at the appropriate times.
If XON/XOFF has been selected, the printer also toggles the DTR signal, as described in the next section, but it does not look at the DSR signal to transmit data.



XON character = hexadecimal 11.
XOFF character = hexadecimal 13.

7.2 DTR/DSR Protocol

The DTR signal is used to control data transmission to the printer. It is driven low when the printer is ready to receive data and driven high when it cannot accept any more data.



8 USB PARAMETERS

Axiohm's implementation of USB complies with "Universal Serial Bus Specification" revision 2.0

8.1 Capabilities

TRITON is a device only, and doesn't provide hub capabilities.
The maximum recommended cable length is 3 meters.
Full speed communication (12Mbits/sec) is supported.

8.2 Interface

The data are exchanged between host and printer via four endpoints:

Endpoint 0x00 : CONTROL
Default endpoint

Endpoint 0x02 : BULK OUT
For transmission of all printable data and commands from host to printer.

Endpoint 0x82 : BULK IN
For return of all synchronous data, status or other types of information except unsolicited status mode messages, from printer to host

Endpoint 0x01 : INTERRUPT OUT
For transmission of real time commands from host to printer.

8.3 Other information

Vendor Id
Axiohm USB Vendor Id = 0x05D9

Product Id
TRITON Product Id = 0xA000

Note : The USB interface is automatically detected.

9 PRINT SPECIFICATION

9.1 Characters

9.1.1 Print Modes

- Available print modes:
- Standard
- Double High
- Double Wide
- Underlined
- Reverse

9.1.2 Size

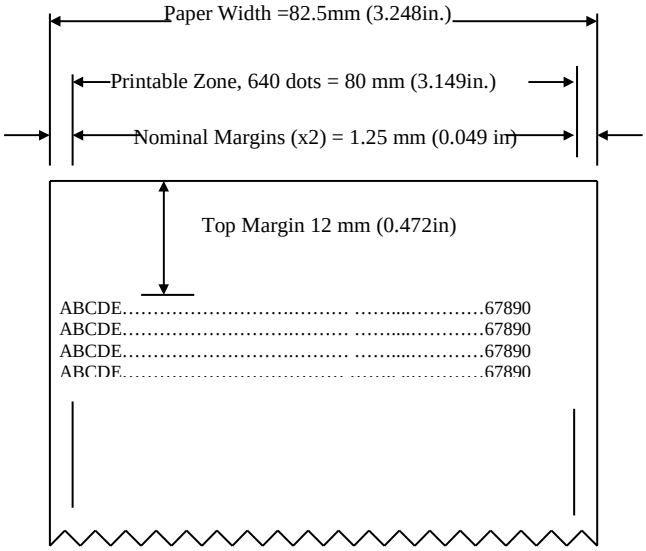
- Characters per Line: 53 or 28
- Cell Size: 12 x 24 Dots or 16 x 24

	12x24	**16x24**
Printing Width: 640 dots	= 640/12 = **53** characters max (width)	=640/16 = **40** characters max (width)

9.2 Print zone

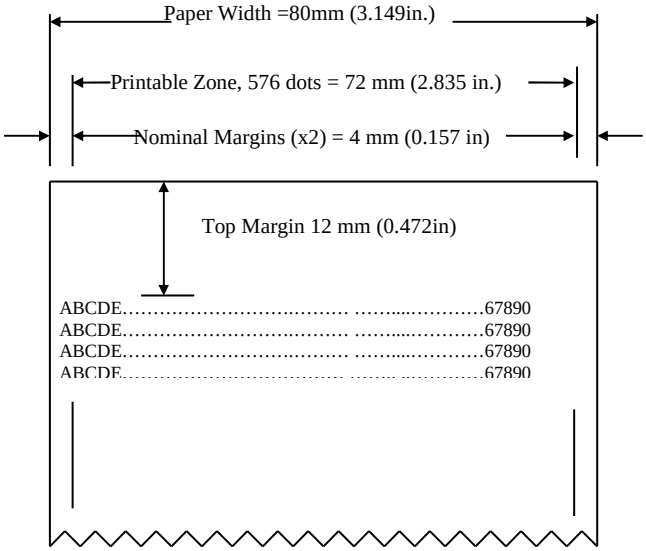
- Print Zones for TRITON 82.5

- 640 dots (addressable) @ 8 dots/mm, centred on 82.5 mm
- Standard mode (font 12x24): 53 columns (80 mm 640 dots max)
- Standard mode (font 16x24): 40 columns (80 mm 640 dots max)
- Standard Mode: minimum margins: 1.25 mm on each size (left and right)



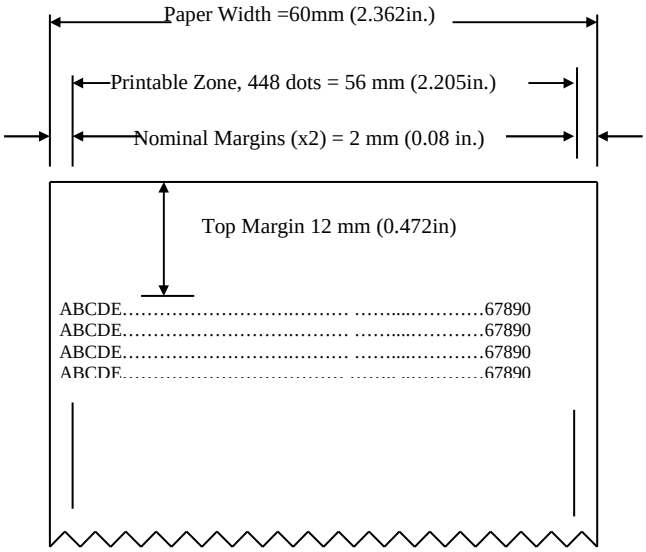
- Print Zones for TRITON 80

- 576 dots (addressable) @ 8 dots/mm, centred on 80 mm
- Standard mode (font 12x24): 48 columns (72mm 576 dots max)
- Standard mode (font 16x24): 36 columns (72mm 576 dots max)
- Standard Mode: minimum margins: 4 mm on each size (left and right)



- Print Zones for TRITON 60

- 448 dots (addressable) @ 8 dots/mm, centred on 60 mm
- Standard mode (font 12x24): 37 columns (56mm 448 dots max)
- Standard mode (font 16x24): 28 columns (56mm 448 dots max)
- Standard Mode: minimum margins: 2.0 mm (0.08 inches)
- Top margin to knife cut: 12 mm (0.472 inches)



9.3 Print density and density of receipt print lines

This function makes it possible to adjust the energy level of the Printhead to darken the printout. An adjustment should only be made when necessary. The factory setting is 100%.

Warning:

Choose an energy level no higher than necessary to achieve a dark printout.
Failure to observe this rule may result in a printer service call or voiding of the printer warranty.
Consult your Axiohm technical support specialist if you have any questions.

9.4 Character sets

9.4.1 Code Page 437

00 0	10 16	20 SP 32	30 0 48	40 @ 64	50 P 80	60 ` 96	70 p 112	80 Ç 128	90 É 144	A0 á 160	B0 ▒ 176	C0 └ 192	D0 ╨ 208	E0 ∝ 224	F0 ≡ 240
01 1	11 17	21 ! 33	31 1 49	41 A 65	51 Q 81	61 a 97	71 q 113	81 ü 129	91 æ 145	A1 í 161	B1 ▓ 177	C1 ┴ 193	D1 ╤ 209	E1 β 225	F1 ± 241
02 2	12 18	22 " 34	32 2 50	42 B 66	52 R 82	62 b 98	72 r 114	82 é 130	92 Æ 146	A2 ó 162	B2 ▓ 178	C2 ┬ 194	D2 ╥ 210	E2 Γ 226	F2 ≥ 242
03 3	13 19	23 # 35	33 3 51	43 C 67	53 S 83	63 c 99	73 s 115	83 â 131	93 ô 147	A3 ú 163	B3 ▒ 179	C3 ├ 195	D3 ╙ 211	E3 π 227	F3 ≤ 243
04 4	14 20	24 $ 36	34 4 52	44 D 68	54 T 84	64 d 100	74 t 116	84 ä 132	94 ö 148	A4 ñ 164	B4 ┤ 180	C4 ─ 196	D4 ╘ 212	E4 Σ 228	F4 ⌠ 244
05 5	15 21	25 % 37	35 5 53	45 E 69	55 U 85	65 e 101	75 u 117	85 à 133	95 ò 149	A5 Ñ 165	B5 ╡ 181	C5 ┼ 197	D5 ╒ 213	E5 σ 229	F5 ⌡ 245
06 6	16 22	26 & 38	36 6 54	46 F 70	56 V 86	66 f 103	76 v 118	86 å 134	96 û 150	A6 ª 166	B6 ╢ 182	C6 ╞ 198	D6 ╓ 214	E6 µ 230	F6 ÷ 246
07 7	17 23	27 ' 39	37 7 55	47 G 71	57 W 87	67 g 103	77 w 119	87 ç 135	97 ù 151	A7 º 167	B7 ╖ 183	C7 ╟ 199	D7 ╫ 215	E7 τ 231	F7 ≈ 247
08 8	18 24	28 (40	38 8 56	48 H 72	58 X 88	68 h 104	78 x 120	88 ê 136	98 ÿ 152	A8 ¿ 168	B8 ╕ 184	C8 ╚ 200	D8 ╪ 216	E8 ϕ 232	F8 ° 248
09 9	19 25	29) 41	39 9 57	49 I 73	59 Y 89	69 i 105	79 y 121	89 ë 137	99 Ö 153	A9 ⌐ 169	B9 ╣ 185	C9 ╔ 201	D9 ┘ 217	E9 Θ 233	F9 • 249
0A 10	1A 26	2A * 42	3A : 58	4A J 74	5A Z 90	6A j 106	7A z 122	8A è 138	9A Ü 154	AA ¬ 170	BA ║ 186	CA ╩ 202	DA ┌ 218	EA Ω 234	FA · 250
0B 11	1B 27	2B + 43	3B ; 59	4B K 75	5B [91	6B k 107	7B { 123	8B ï 139	9B ¢ 155	AB ½ 171	BB ╗ 187	CB ╦ 203	DB ▉ 219	EB δ 235	FB √ 251
0C 12	1C 28	2C , 44	3C < 60	4C L 76	5C \ 92	6C l 108	7C | 124	8C î 140	9C £ 156	AC ¼ 172	BC ╝ 188	CC ╠ 204	DC ▄ 220	EC ∞ 236	FC n 252
0D 13	1D 29	2D - 45	3D = 61	4D M 77	5D] 93	6D m 109	7D } 125	8D ì 141	9D ¥ 157	AD ¡ 173	BD ╜ 189	CD ═ 205	DD ▌ 221	ED ∅ 237	FD ² 253
0E 14	1E 30	2E . 46	3E > 62	4E N 78	5E ^ 94	6E n 110	7E ~ 126	8E Ä 142	9E Pt 158	AE « 174	BE ╛ 190	CE ╬ 206	DE ▐ 222	EE ε 238	FE ■ 254
0F 15	1F 31	2F / 47	3F ? 63	4F O 79	5F _ 95	6F o 111	7F DEL △ 127	8F Å 143	9F ƒ 159	AF » 175	BF ┐ 191	CF ╧ 207	DF ▀ 223	EF ∩ 239	FF BLANK 255

9.4.2 Code Page 737

	—0	—1	—2	—3	—4	—5	—6	—7	—8	—9	—A	—B	—C	—D	—E	—F
0–	NUL 0000	SOH 0001	STX 0002	ETX 0003	EOT 0004	ENQ 0005	ACK 0006	BEL 0007	BS 0008	HT 0009	LF 000A	VT 000B	FF 000C	CR 000D	SO 000E	SI 000F
1–	DLE 0010	DC1 0011	DC2 0012	DC3 0013	DC4 0014	NAK 0015	SYN 0016	ETB 0017	CAN 0018	EM 0019	SUB 001A	ESC 001B	FS 001C	GS 001D	RS 001E	US 001F
2–	SP 0020	! 0021	« 0022	# 0023	$ 0024	% 0025	& 0026	‘ 0027	(0028	) 0029	* 002A	+ 002B	, 002C	- 002D	. 002E	/ 002F
3–	0 0030	1 0031	2 0032	3 0033	4 0034	5 0035	6 0036	7 0037	8 0038	9 0039	: 003A	; 003B	< 003C	= 003D	> 003E	? 003F
4–	@ 0040	A 0041	B 0042	C 0043	D 0044	E 0045	F 0046	G 0047	H 0048	I 0049	J 004A	K 004B	L 004C	M 004D	N 004E	O 004F
5–	P 0050	Q 0051	R 0052	S 0053	T 0054	U 0055	V 0056	W 0057	X 0058	Y 0059	Z 005A	[005B	\ 005C	] 005D	^ 005E	_ 005F
6–	` 0060	a 0061	b 0062	c 0063	d 0064	e 0065	f 0066	g 0067	h 0068	i 0069	j 006A	k 006B	l 006C	m 006D	n 006E	o 006F
7–	p 0070	q 0071	r 0072	s 0073	t 0074	u 0075	v 0076	w 0077	x 0078	y 0079	z 007A	{ 007B	| 007C	} 007D	~ 007E	⌂ 2302
8–	Α 391	Β 392	Γ 393	Δ 394	Ε 395	Ζ 396	Η 397	Θ 398	Ι 399	Κ 39A	Λ 39B	Μ 39C	Ν 39D	Ξ 39E	Ο 39F	Π 3A0
9–	Ρ 3A1	Σ 3A3	Τ 3A4	Υ 3A5	Φ 3A6	Χ 3A7	Ψ 3A8	Ω 3A9	α 3B1	β 3B2	γ 3B3	δ 3B4	ε 3B5	ζ 3B6	η 3B7	θ 3B8
A–	ι 3B9	κ 3BA	λ 3BB	μ 3BC	ν 3BD	ξ 3BE	ο 3BF	π 3C0	ρ 3C1	σ 3C3	ς 3C2	τ 3C4	υ 3C5	φ 3C6	χ 3C7	ψ 3C8
B–	░ 2591	▒ 2592	▓ 2593	│ 2502	┤ 2524	╡ 2561	╢ 2562	╖ 2556	╕ 2555	╣ 2563	║ 2551	╗ 2557	╝ 255D	╜ 255C	╛ 255B	┐ 2510
C–	└ 2514	┴ 2534	┬ 252C	├ 251C	─ 2500	┼ 253C	╞ 255E	╟ 255F	╚ 255A	╔ 2554	╩ 2569	╦ 2566	╠ 2560	═ 2550	╬ 256C	╧ 2567
D–	╨ 2568	╤ 2564	╥ 2565	╙ 2559	╘ 2558	╒ 2552	╓ 2553	╫ 256B	╪ 256A	┘ 2518	┌ 250C	▉ 2588	▄ 2584	▌ 258C	▐ 2590	▀ 2580
E–	ω 3C9	ά 3AC	έ 3AD	ή 3AE	ϊ 3CA	ί 3AF	ό 3CC	ύ 3CD	ϋ 3CB	ώ 3CE	Ά 386	Έ 388	Ή 389	Ί 38A	Ό 38C	Ύ 38E
F–	Ώ 38F	± B1	≥ 2265	≤ 2264	Ϊ 3AA	Ϋ 3AB	÷ F7	≈ 2248	° B0	∙ 2219	· B7	√ 221A	n 207F	2 B2	■ 25A0	A0

9.4.3 Code Page 850

00 0	10 16	20 32	30 0 48	40 @ 64	50 P 80	60 ` 96	70 p 112	80 Ç 128	90 É 144	A0 á 160	B0 ⋮ 176	C0 └ 192	D0 ð 208	E0 Ó 224	F0 240
01 1	11 17	21 ! 33	31 1 49	41 A 65	51 Q 81	61 a 97	71 q 113	81 ü 129	91 æ 145	A1 í 161	B1 ▒ 177	C1 ┴ 193	D1 Đ 209	E1 ß 225	F1 ± 241
02 2	12 18	22 " 34	32 2 50	42 B 66	52 R 82	62 b 98	72 r 114	82 é 130	92 Æ 146	A2 ó 162	B2 ▓ 178	C2 ┬ 194	D2 Ê 210	E2 Ô 226	F2 ‗ 242
03 3	13 19	23 # 35	33 3 51	43 C 67	53 S 83	63 c 99	73 s 115	83 â 131	93 ô 147	A3 ú 163	B3 │ 179	C3 ├ 195	D3 Ë 211	E3 Ò 227	F3 ¾ 243
04 4	14 20	24 $ 36	34 4 52	44 D 68	54 T 84	64 d 100	74 t 116	84 ä 132	94 ö 148	A4 ñ 164	B4 ┤ 180	C4 ─ 196	D4 È 212	E4 õ 228	F4 ¶ 244
05 5	15 21	25 % 37	35 5 53	45 E 69	55 U 85	65 e 101	75 u 117	85 à 133	95 ò 149	A5 Ñ 165	B5 Á 181	C5 ┼ 197	D5 ı 213	E5 Õ 229	F5 § 245
06 6	16 22	26 & 38	36 6 54	46 F 70	56 V 86	66 f 103	76 v 118	86 å 134	96 û 150	A6 ª 166	B6 Â 182	C6 ã 198	D6 Í 214	E6 µ 230	F6 ÷ 246
07 7	17 23	27 ' 39	37 7 55	47 G 71	57 W 87	67 g 103	77 w 119	87 ç 135	97 ù 151	A7 º 167	B7 À 183	C7 Ã 199	D7 Î 215	E7 þ 231	F7 ¸ 247
08 8	18 24	28 (40	38 8 56	48 H 72	58 X 88	68 h 104	78 x 120	88 ê 136	98 ÿ 152	A8 ¿ 168	B8 © 184	C8 ╚ 200	D8 Ï 216	E8 Þ 232	F8 º 248
09 9	19 25	29) 41	39 9 57	49 I 73	59 Y 89	69 i 105	79 y 121	89 ë 137	99 Ö 153	A9 ® 169	B9 ╣ 185	C9 ╔ 201	D9 ┘ 217	E9 Ú 233	F9 ¨ 249
0A 10	1A 26	2A * 42	3A : 58	4A J 74	5A Z 90	6A j 106	7A z 122	8A è 138	9A Ü 154	AA ¬ 170	BA ║ 186	CA ╩ 202	DA ┌ 218	EA Û 234	FA · 250
0B 11	1B 27	2B + 43	3B ; 59	4B K 75	5B [91	6B k 107	7B { 123	8B ï 139	9B ø 155	AB ½ 171	BB ╗ 187	CB ╦ 203	DB ▉ 219	EB Ù 235	FB ¹ 251
0C 12	1C 28	2C , 44	3C < 60	4C L 76	5C \ 92	6C l 108	7C | 124	8C î 140	9C £ 156	AC ¼ 172	BC ╝ 188	CC ╠ 204	DC ▄ 220	EC ý 236	FC ³ 252
0D 13	1D 29	2D - 45	3D = 61	4D M 77	5D] 93	6D m 109	7D } 125	8D ì 141	9D Ø 157	AD ¡ 173	BD ¢ 189	CD ═ 205	DD ¦ 221	ED Ý 237	FD ² 253
0E 14	1E 30	2E . 46	3E > 62	4E N 78	5E ^ 94	6E n 110	7E ~ 126	8E Ä 142	9E × 158	AE « 174	BE ¥ 190	CE ╬ 206	DE Ì 222	EE ¯ 238	FE ■ 254
0F 15	1F 31	2F / 47	3F ? 63	4F O 79	5F _ 95	6F o 111	7F △ 127	8F Å 143	9F ƒ 159	AF » 175	BF ┐ 191	CF ¤ 207	DF ▀ 223	EF ´ 239	FF 255

9.4.4 Code Page 852

00 0	10 16	20 32	30 0 48	40 @ 64	50 P 80	60 ` 96	70 p 112	80 Ç 128	90 É 144	A0 á 160	B0 ⁝ 176	C0 └ 192	D0 đ 208	E0 Ó 224	F0 240
01 1	11 17	21 ! 33	31 1 49	41 A 65	51 Q 81	61 a 97	71 q 113	81 ü 129	91 Ĺ 145	A1 í 161	B1 ▒ 177	C1 ┴ 193	D1 Đ 209	E1 ß 225	F1 ˝ 241
02 2	12 18	22 " 34	32 2 50	42 B 66	52 R 82	62 b 98	72 r 114	82 é 130	92 Í 146	A2 ó 162	B2 ▓ 178	C2 ┬ 194	D2 Ď 210	E2 Ô 226	F2 ˛ 242
03 3	13 19	23 # 35	33 3 51	43 C 67	53 S 83	63 c 99	73 s 115	83 â 131	93 ô 147	A3 ú 163	B3 │ 179	C3 ├ 195	D3 Ë 211	E3 Ń 227	F3 ˇ 243
04 4	14 20	24 $ 36	34 4 52	44 D 68	54 T 84	64 d 100	74 t 116	84 ä 132	94 ö 148	A4 Ą 164	B4 ┤ 180	C4 ─ 196	D4 ď 212	E4 ń 228	F4 ˆ 244
05 5	15 21	25 % 37	35 5 53	45 E 69	55 U 85	65 e 101	75 u 117	85 ů 133	95 Ľ 149	A5 ą 165	B5 Á 181	C5 ┼ 197	D5 Ň 213	E5 ň 229	F5 § 245
06 6	16 22	26 & 38	36 6 54	46 F 70	56 V 86	66 f 103	76 v 118	86 ć 134	96 ĺ 150	A6 Ž 166	B6 Â 182	C6 Ă 198	D6 Í 214	E6 Š 230	F6 ÷ 246
07 7	17 23	27 ' 39	37 7 55	47 G 71	57 W 87	67 g 103	77 w 119	87 ç 135	97 Ś 151	A7 ž 167	B7 Ě 183	C7 ă 199	D7 Î 215	E7 š 231	F7 ¸ 247
08 8	18 24	28 (40	38 8 56	48 H 72	58 X 88	68 h 104	78 x 120	88 ł 136	98 ś 152	A8 Ę 168	B8 Ş 184	C8 ╚ 200	D8 ě 216	E8 Ŕ 232	F8 ° 248
09 9	19 25	29) 41	39 9 57	49 I 73	59 Y 89	69 i 105	79 y 121	89 ë 137	99 Ö 153	A9 ę 169	B9 ╣ 185	C9 ╔ 201	D9 ┘ 217	E9 Ú 233	F9 ¨ 249
0A 10	1A 26	2A * 42	3A : 58	4A J 74	5A Z 90	6A j 106	7A z 122	8A Ő 138	9A Ü 154	AA 170	BA ║ 186	CA ╩ 202	DA ┌ 218	EA ŕ 234	FA · 250
0B 11	1B 27	2B + 43	3B ; 59	4B K 75	5B [91	6B k 107	7B { 123	8B ő 139	9B Ť 155	AB ź 171	BB ╗ 187	CB ╦ 203	DB ▉ 219	EB Ű 235	FB ű 251
0C 12	1C 28	2C , 44	3C < 60	4C L 76	5C \ 92	6C l 108	7C | 124	8C î 140	9C ť 156	AC Č 172	BC ╝ 188	CC ╠ 204	DC ▄ 220	EC ý 236	FC Ř 252
0D 13	1D 29	2D - 45	3D = 61	4D M 77	5D] 93	6D m 109	7D } 125	8D Ź 141	9D Ł 157	AD ş 173	BD Ž 189	CD ═ 205	DD Ţ 221	ED Ý 237	FD ř 253
0E 14	1E 30	2E . 46	3E > 62	4E N 78	5E ^ 94	6E n 110	7E ~ 126	8E Ä 142	9E × 158	AE « 174	BE ž 190	CE ╬ 206	DE Ů 222	EE ţ 238	FE ▪ 254
0F 15	1F 31	2F / 47	3F ? 63	4F O 79	5F _ 95	6F o 111	7F △ 127	8F Ć 143	9F č 159	AF » 175	BF ┐ 191	CF ¤ 207	DF ▀ 223	EF ´ 239	FF 255

9.4.5 Code Page 858

00 0	10 16	20 32	30 0 48	40 @ 64	50 P 80	60 ` 96	70 p 112	80 Ç 128	90 É 144	A0 á 160	B0 ⁞ 176	C0 └ 192	D0 ð 208	E0 Ó 224	F0 240
01 1	11 17	21 ! 33	31 1 49	41 A 65	51 Q 81	61 a 97	71 q 113	81 ü 129	91 æ 145	A1 í 161	B1 ▒ 177	C1 ┴ 193	D1 Đ 209	E1 ß 225	F1 ± 241
02 2	12 18	22 " 34	32 2 50	42 B 66	52 R 82	62 b 98	72 r 114	82 é 130	92 Æ 146	A2 ó 162	B2 ▓ 178	C2 ┬ 194	D2 Ê 210	E2 Ô 226	F2 ‗ 242
03 3	13 19	23 # 35	33 3 51	43 C 67	53 S 83	63 c 99	73 s 115	83 â 131	93 ô 147	A3 ú 163	B3 │ 179	C3 ├ 195	D3 Ë 211	E3 Ò 227	F3 ¾ 243
04 4	14 20	24 $ 36	34 4 52	44 D 68	54 T 84	64 d 100	74 t 116	84 ä 132	94 ö 148	A4 ñ 164	B4 ┤ 180	C4 ─ 196	D4 È 212	E4 õ 228	F4 ¶ 244
05 5	15 21	25 % 37	35 5 53	45 E 69	55 U 85	65 e 101	75 u 117	85 à 133	95 ò 149	A5 Ñ 165	B5 Á 181	C5 ┼ 197	D5 € 213	E5 Õ 229	F5 § 245
06 6	16 22	26 & 38	36 6 54	46 F 70	56 V 86	66 f 103	76 v 118	86 å 134	96 û 150	A6 ª 166	B6 Â 182	C6 ã 198	D6 Í 214	E6 µ 230	F6 ÷ 246
07 7	17 23	27 ' 39	37 7 55	47 G 71	57 W 87	67 g 103	77 w 119	87 ç 135	97 ù 151	A7 º 167	B7 À 183	C7 Ã 199	D7 Î 215	E7 þ 231	F7 ¸ 247
08 8	18 24	28 (40	38 8 56	48 H 72	58 X 88	68 h 104	78 x 120	88 ê 136	98 ÿ 152	A8 ¿ 168	B8 © 184	C8 ╚ 200	D8 Ï 216	E8 Þ 232	F8 º 248
09 9	19 25	29) 41	39 9 57	49 I 73	59 Y 89	69 i 105	79 y 121	89 ë 137	99 Ö 153	A9 ® 169	B9 ╣ 185	C9 ╔ 201	D9 ┘ 217	E9 Ú 233	F9 ¨ 249
0A 10	1A 26	2A * 42	3A : 58	4A J 74	5A Z 90	6A j 106	7A z 122	8A è 138	9A Ü 154	AA ¬ 170	BA ║ 186	CA ╩ 202	DA ┌ 218	EA Û 234	FA · 250
0B 11	1B 27	2B + 43	3B ; 59	4B K 75	5B [91	6B k 107	7B { 123	8B ï 139	9B ø 155	AB ½ 171	BB ╗ 187	CB ╦ 203	DB ▉ 219	EB Ù 235	FB ¹ 251
0C 12	1C 28	2C , 44	3C < 60	4C L 76	5C \ 92	6C l 108	7C | 124	8C î 140	9C £ 156	AC ¼ 172	BC ╝ 188	CC ╠ 204	DC ▄ 220	EC ý 236	FC ³ 252
0D 13	1D 29	2D - 45	3D = 61	4D M 77	5D] 93	6D m 109	7D } 125	8D ì 141	9D Ø 157	AD ¡ 173	BD ¢ 189	CD ═ 205	DD ¦ 221	ED Ý 237	FD ² 253
0E 14	1E 30	2E . 46	3E > 62	4E N 78	5E ^ 94	6E n 110	7E ~ 126	8E Ä 142	9E × 158	AE « 174	BE ¥ 190	CE ╬ 206	DE Ì 222	EE ¯ 238	FE ■ 254
0F 15	1F 31	2F / 47	3F ? 63	4F O 79	5F _ 95	6F o 111	7F △ 127	8F Å 143	9F ƒ 159	AF » 175	BF ┐ 191	CF ¤ 207	DF ▀ 223	EF ´ 239	FF 255

9.4.6 Code Page 860

00 NUL 0	10 16	20 SP 32	30 0 48	40 @ 64	50 P 80	60 ` 96	70 p 112	80 Ç 128	90 É 144	A0 á 160	B0 ⣿ 176	C0 └ 192	D0 ╨ 208	E0 α 224	F0 ≡ 240
01 1	11 XON 17	21 ! 33	31 1 49	41 A 65	51 Q 81	61 a 97	71 q 113	81 ü 129	91 À 145	A1 í 161	B1 ⣿ 177	C1 ┴ 193	D1 ╤ 209	E1 β 225	F1 ± 241
02 2	12 18	22 " 34	32 2 50	42 B 66	52 R 82	62 b 98	72 r 114	82 é 130	92 È 146	A2 ó 162	B2 ⣿ 178	C2 ┬ 194	D2 ╥ 210	E2 Γ 226	F2 ≥ 242
03 3	13 XOFF 19	23 # 35	33 3 51	43 C 67	53 S 83	63 c 99	73 s 115	83 â 131	93 ô 147	A3 ú 163	B3 ⣿ 179	C3 ├ 195	D3 ╙ 211	E3 π 227	F3 ≤ 243
04 4	14 20	24 $ 36	34 4 52	44 D 68	54 T 84	64 d 100	74 t 116	84 ã 132	94 õ 148	A4 ñ 164	B4 ⣿ 180	C4 ─ 196	D4 ╘ 212	E4 Σ 228	F4 ⌠ 244
05 5	15 21	25 % 37	35 5 53	45 E 69	55 U 85	65 e 101	75 u 117	85 à 133	95 ò 149	A5 Ñ 165	B5 ⣿ 181	C5 ┼ 197	D5 ╒ 213	E5 σ 229	F5 ⌡ 245
06 6	16 22	26 & 38	36 6 54	46 F 70	56 V 86	66 f 103	76 v 118	86 Á 134	96 Ú 150	A6 ª 166	B6 ⣿ 182	C6 ╞ 198	D6 ╓ 214	E6 µ 230	F6 ÷ 246
07 7	17 23	27 ' 39	37 7 55	47 G 71	57 W 87	67 g 103	77 w 119	87 ç 135	97 ù 151	A7 º 167	B7 ⣿ 183	C7 ╟ 199	D7 ╫ 215	E7 τ 231	F7 ≈ 247
08 8	18 24	28 (40	38 8 56	48 H 72	58 X 88	68 h 104	78 x 120	88 ê 136	98 Ì 152	A8 ¿ 168	B8 ⣿ 184	C8 ╚ 200	D8 ╪ 216	E8 ϕ 232	F8 ° 248
09 9	19 25	29) 41	39 9 57	49 I 73	59 Y 89	69 i 105	79 y 121	89 Ê 137	99 Õ 153	A9 Ò 169	B9 ⣿ 185	C9 ╔ 201	D9 ┘ 217	E9 Θ 233	F9 • 249
0A LF 10	1A 26	2A * 42	3A : 58	4A J 74	5A Z 90	6A j 106	7A z 122	8A è 138	9A Ü 154	AA ¬ 170	BA ⣿ 186	CA ╩ 202	DA ┌ 218	EA Ω 234	FA · 250
0B 11	1B ESC 27	2B + 43	3B ; 59	4B K 75	5B [91	6B k 107	7B { 123	8B Í 139	9B ¢ 155	AB ½ 171	BB ⣿ 187	CB ╦ 203	DB ⣿ 219	EB δ 235	FB √ 251
0C 12	1C 28	2C , 44	3C < 60	4C L 76	5C \ 92	6C l 108	7C | 124	8C Ô 140	9C £ 156	AC ¼ 172	BC ⣿ 188	CC ╠ 204	DC ▄ 220	EC ∞ 236	FC n 252
0D CR 13	1D GS 29	2D - 45	3D = 61	4D M 77	5D] 93	6D m 109	7D } 125	8D ì 141	9D Ú 157	AD ¡ 173	BD ⣿ 189	CD ═ 205	DD ▌ 221	ED ∅ 237	FD ² 253
0E 14	1E 30	2E . 46	3E > 62	4E N 78	5E ^ 94	6E n 110	7E ~ 126	8E Ã 142	9E Pt 158	AE « 174	BE ⣿ 190	CE ╬ 206	DE ▐ 222	EE ε 238	FE ■ 254
0F 15	1F 31	2F / 47	3F ? 63	4F O 79	5F _ 95	6F o 111	7F SP 127	8F Â 143	9F Ó 159	AF » 175	BF ⣿ 191	CF ╧ 207	DF ▀ 223	EF ∩ 239	FF 255

9.4.7 Code Page 862

00 0	10 16	20 32	30 0 48	40 @ 64	50 P 80	60 ` 96	70 p 112	80 א 128	90 נ 144	A0 á 160	B0 ⁝ 176	C0 └ 192	D0 ╨ 208	E0 ∝ 224	F0 ≡ 240
01 1	11 17	21 ! 33	31 1 49	41 A 65	51 Q 81	61 a 97	71 q 113	81 ב 129	91 ס 145	A1 í 161	B1 ⁞ 177	C1 ┴ 193	D1 ╤ 209	E1 β 225	F1 ± 241
02 2	12 18	22 " 34	32 2 50	42 B 66	52 R 82	62 b 98	72 r 114	82 ג 130	92 ע 146	A2 ó 162	B2 ⁝ 178	C2 ┬ 194	D2 ╥ 210	E2 Γ 226	F2 ≥ 242
03 3	13 19	23 # 35	33 3 51	43 C 67	53 S 83	63 c 99	73 s 115	83 ד 131	93 ף 147	A3 ú 163	B3 ⁞ 179	C3 ├ 195	D3 ╙ 211	E3 π 227	F3 ≤ 243
04 4	14 20	24 $ 36	34 4 52	44 D 68	54 T 84	64 d 100	74 t 116	84 ה 132	94 פ 148	A4 ñ 164	B4 ⁞ 180	C4 ─ 196	D4 ╘ 212	E4 Σ 228	F4 ⌠ 244
05 5	15 21	25 % 37	35 5 53	45 E 69	55 U 85	65 e 101	75 u 117	85 ו 133	95 ץ 149	A5 Ñ 165	B5 ⁞ 181	C5 ┼ 197	D5 ╒ 213	E5 σ 229	F5 ⌡ 245
06 6	16 22	26 & 38	36 6 54	46 F 70	56 V 86	66 f 103	76 v 118	86 ז 134	96 צ 150	A6 ª 166	B6 ⁞ 182	C6 ╞ 198	D6 ╓ 214	E6 µ 230	F6 ÷ 246
07 7	17 23	27 ' 39	37 7 55	47 G 71	57 W 87	67 g 103	77 w 119	87 ח 135	97 ק 151	A7 º 167	B7 ⁞ 183	C7 ╟ 199	D7 ╫ 215	E7 τ 231	F7 ≈ 247
08 8	18 24	28 (40	38 8 56	48 H 72	58 X 88	68 h 104	78 x 120	88 ט 136	98 ר 152	A8 ¿ 168	B8 ⁞ 184	C8 ╚ 200	D8 ╪ 216	E8 Φ 232	F8 ° 248
09 9	19 25	29) 41	39 9 57	49 I 73	59 Y 89	69 i 105	79 y 121	89 י 137	99 ש 153	A9 ⌐ 169	B9 ⁞ 185	C9 ╔ 201	D9 ┘ 217	E9 Θ 233	F9 • 249
0A 10	1A 26	2A * 42	3A : 58	4A J 74	5A Z 90	6A j 106	7A z 122	8A ך 138	9A ת 154	AA ¬ 170	BA ⁞ 186	CA ╩ 202	DA ┌ 218	EA Ω 234	FA · 250
0B 11	1B 27	2B + 43	3B ; 59	4B K 75	5B [91	6B k 107	7B { 123	8B כ 139	9B ¢ 155	AB ½ 171	BB ⁞ 187	CB ╦ 203	DB ▉ 219	EB δ 235	FB √ 251
0C 12	1C 28	2C , 44	3C < 60	4C L 76	5C \ 92	6C l 108	7C | 124	8C ל 140	9C £ 156	AC ¼ 172	BC ⁞ 188	CC ╠ 204	DC ▄ 220	EC ∞ 236	FC n 252
0D 13	1D 29	2D - 45	3D = 61	4D M 77	5D] 93	6D m 109	7D } 125	8D ם 141	9D ¥ 157	AD ¡ 173	BD ⁞ 189	CD ═ 205	DD ▌ 221	ED ∅ 237	FD ² 253
0E 14	1E 30	2E . 46	3E > 62	4E N 78	5E ^ 94	6E n 110	7E ~ 126	8E מ 142	9E Pt 158	AE « 174	BE ⁞ 190	CE ╬ 206	DE ▐ 222	EE ε 238	FE ■ 254
0F 15	1F 31	2F / 47	3F ? 63	4F O 79	5F _ 95	6F o 111	7F △ 127	8F ן 143	9F ƒ 159	AF ¤ 175	BF ⁞ 191	CF ╧ 207	DF ▀ 223	EF ∩ 239	FF 255

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00 NUL 0	10 16	20 SP 32	30 0 48	40 @ 64	50 P 80	60 ` 96	70 p 112	80 Ç 128	90 É 144	A0 ¦ 160	B0 ⣿ 176	C0 └ 192	D0 ⊥ 208	E0 α 224	F0 ≡ 240
01 1	11 XON 17	21 ! 33	31 1 49	41 A 65	51 Q 81	61 a 97	71 q 113	81 ü 129	91 È 145	A1 ' 161	B1 ⣿ 177	C1 ┴ 193	D1 ╤ 209	E1 β 225	F1 ± 241
02 2	12 18	22 " 34	32 2 50	42 B 66	52 R 82	62 b 98	72 r 114	82 é 130	92 Ê 146	A2 ó 162	B2 ⣿ 178	C2 ┬ 194	D2 ╥ 210	E2 Γ 226	F2 ≥ 242
03 3	13 XOFF 19	23 # 35	33 3 51	43 C 67	53 S 83	63 c 99	73 s 115	83 â 131	93 ô 147	A3 ú 163	B3 ⣿ 179	C3 ├ 195	D3 ╙ 211	E3 π 227	F3 ≤ 243
04 4	14 20	24 $ 36	34 4 52	44 D 68	54 T 84	64 d 100	74 t 116	84 Â 132	94 Ë 148	A4 ¨ 164	B4 ⣿ 180	C4 ─ 196	D4 ╘ 212	E4 Σ 228	F4 ⌠ 244
05 5	15 21	25 % 37	35 5 53	45 E 69	55 U 85	65 e 101	75 u 117	85 à 133	95 Ï 149	A5 ³ 165	B5 ⣿ 181	C5 ┼ 197	D5 ╒ 213	E5 σ 229	F5 ⌡ 245
06 6	16 22	26 & 38	36 6 54	46 F 70	56 V 86	66 f 103	76 v 118	86 ¶ 134	96 û 150	A6 ¸ 166	B6 ⣿ 182	C6 ╞ 198	D6 ╓ 214	E6 µ 230	F6 ÷ 246
07 7	17 23	27 ' 39	37 7 55	47 G 71	57 W 87	67 g 103	77 w 119	87 ç 135	97 ù 151	A7 ¯ 167	B7 ⣿ 183	C7 ╟ 199	D7 ╫ 215	E7 τ 231	F7 ≈ 247
08 8	18 24	28 (40	38 8 56	48 H 72	58 X 88	68 h 104	78 x 120	88 ê 136	98 ¤ 152	A8 Î 168	B8 ⣿ 184	C8 ╚ 200	D8 ╪ 216	E8 ϕ 232	F8 ° 248
09 9	19 25	29) 41	39 9 57	49 I 73	59 Y 89	69 i 105	79 y 121	89 ë 137	99 ô 153	A9 ⌐ 169	B9 ⣿ 185	C9 ╔ 201	D9 ┘ 217	E9 Θ 233	F9 • 249
0A LF 10	1A 26	2A * 42	3A : 58	4A J 74	5A Z 90	6A j 106	7A z 122	8A è 138	9A Ü 154	AA ¬ 170	BA ⣿ 186	CA ╩ 202	DA ┌ 218	EA Ω 234	FA · 250
0B 11	1B ESC 27	2B + 43	3B ; 59	4B K 75	5B [91	6B k 107	7B { 123	8B ï 139	9B ¢ 155	AB ½ 171	BB ⣿ 187	CB ╦ 203	DB ⣿ 219	EB δ 235	FB √ 251
0C 12	1C 28	2C , 44	3C < 60	4C L 76	5C \ 92	6C l 108	7C | 124	8C î 140	9C £ 156	AC ¼ 172	BC ⣿ 188	CC ╠ 204	DC ▄ 220	EC ∞ 236	FC n 252
0D CR 13	1D GS 29	2D - 45	3D = 61	4D M 77	5D] 93	6D m 109	7D } 125	8D = 141	9D ù 157	AD ¾ 173	BD ⣿ 189	CD ═ 205	DD ▌ 221	ED ∅ 237	FD ² 253
0E 14	1E 30	2E . 46	3E > 62	4E N 78	5E ^ 94	6E n 110	7E ~ 126	8E À 142	9E Û 158	AE « 174	BE ⣿ 190	CE ╬ 206	DE ▐ 222	EE ε 238	FE ■ 254
0F 15	1F 31	2F / 47	3F ? 63	4F O 79	5F _ 95	6F o 111	7F SP 127	8F § 143	9F ƒ 159	AF » 175	BF ⣿ 191	CF ╧ 207	DF ▀ 223	EF ∩ 239	FF 255

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00 0	10 16	20 32	30 0 48	40 @ 64	50 P 80	60 ` 96	70 p 112	80 Ç 128	90 É 144	A0 á 160	B0 ⁝ 176	C0 └ 192	D0 ╨ 208	E0 ∝ 224	F0 ≡ 240
01 1	11 17	21 ! 33	31 1 49	41 A 65	51 Q 81	61 a 97	71 q 113	81 ü 129	91 æ 145	A1 í 161	B1 ▒ 177	C1 ┴ 193	D1 ╤ 209	E1 β 225	F1 ± 241
02 2	12 18	22 " 34	32 2 50	42 B 66	52 R 82	62 b 98	72 r 114	82 é 130	92 Æ 146	A2 ó 162	B2 ▓ 178	C2 ┬ 194	D2 ╥ 210	E2 Γ 226	F2 ≥ 242
03 3	13 19	23 # 35	33 3 51	43 C 67	53 S 83	63 c 99	73 s 115	83 â 131	93 ô 147	A3 ú 163	B3 │ 179	C3 ├ 195	D3 ╙ 211	E3 π 227	F3 ≤ 243
04 4	14 20	24 $ 36	34 4 52	44 D 68	54 T 84	64 d 100	74 t 116	84 ä 132	94 ö 148	A4 ñ 164	B4 ┤ 180	C4 ─ 196	D4 ╘ 212	E4 Σ 228	F4 ⌠ 244
05 5	15 21	25 % 37	35 5 53	45 E 69	55 U 85	65 e 101	75 u 117	85 à 133	95 ò 149	A5 Ñ 165	B5 ╡ 181	C5 ┼ 197	D5 ╒ 213	E5 σ 229	F5 ⌡ 245
06 6	16 22	26 & 38	36 6 54	46 F 70	56 V 86	66 f 103	76 v 118	86 å 134	96 û 150	A6 ª 166	B6 ╢ 182	C6 ╞ 198	D6 ╓ 214	E6 µ 230	F6 ÷ 246
07 7	17 23	27 ' 39	37 7 55	47 G 71	57 W 87	67 g 103	77 w 119	87 ç 135	97 ù 151	A7 º 167	B7 ╖ 183	C7 ╟ 199	D7 ╫ 215	E7 τ 231	F7 ≈ 247
08 8	18 24	28 (40	38 8 56	48 H 72	58 X 88	68 h 104	78 x 120	88 ê 136	98 ÿ 152	A8 ¿ 168	B8 ╕ 184	C8 ╚ 200	D8 ╪ 216	E8 ϕ 232	F8 ° 248
09 9	19 25	29) 41	39 9 57	49 I 73	59 Y 89	69 i 105	79 y 121	89 ë 137	99 Ö 153	A9 ⌐ 169	B9 ╣ 185	C9 ╔ 201	D9 ┘ 217	E9 Θ 233	F9 ∙ 249
0A 10	1A 26	2A * 42	3A : 58	4A J 74	5A Z 90	6A j 106	7A z 122	8A è 138	9A Ü 154	AA ¬ 170	BA ║ 186	CA ╩ 202	DA ┌ 218	EA Ω 234	FA · 250
0B 11	1B 27	2B + 43	3B ; 59	4B K 75	5B [91	6B k 107	7B { 123	8B ï 139	9B ø 155	AB ½ 171	BB ╗ 187	CB ╦ 203	DB ▉ 219	EB δ 235	FB √ 251
0C 12	1C 28	2C , 44	3C < 60	4C L 76	5C \ 92	6C l 108	7C | 124	8C î 140	9C £ 156	AC ¼ 172	BC ╝ 188	CC ╠ 204	DC ▄ 220	EC ∞ 236	FC n 252
0D 13	1D 29	2D - 45	3D = 61	4D M 77	5D] 93	6D m 109	7D } 125	8D ì 141	9D Ø 157	AD ¡ 173	BD ╜ 189	CD ═ 205	DD ▌ 221	ED ∅ 237	FD ² 253
0E 14	1E 30	2E . 46	3E > 62	4E N 78	5E ^ 94	6E n 110	7E ~ 126	8E Ä 142	9E Pt 158	AE « 174	BE ╛ 190	CE ╬ 206	DE ▐ 222	EE ε 238	FE ■ 254
0F 15	1F 31	2F / 47	3F ? 63	4F O 79	5F _ 95	6F o 111	7F △ 127	8F Å 143	9F ƒ 159	AF ¤ 175	BF ┐ 191	CF ╧ 207	DF ▀ 223	EF ∩ 239	FF 255

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00 0	10 16	20 32	30 0 48	40 @ 64	50 P 80	60 ` 96	70 p 112	80 А 128	90 Р 144	A0 а 160	B0 ▒ 176	C0 └ 192	D0 ╨ 208	E0 р 224	F0 Ё 240
01 1	11 17	21 ! 33	31 1 49	41 A 65	51 Q 81	61 a 97	71 q 113	81 Б 129	91 С 145	A1 б 161	B1 ▓ 177	C1 ┴ 193	D1 ╤ 209	E1 с 225	F1 ё 241
02 2	12 18	22 " 34	32 2 50	42 B 66	52 R 82	62 b 98	72 r 114	82 В 130	92 Т 146	A2 в 162	B2 ▓ 178	C2 ┬ 194	D2 ╥ 210	E2 т 226	F2 Є 242
03 3	13 19	23 # 35	33 3 51	43 C 67	53 S 83	63 c 99	73 s 115	83 Г 131	93 У 147	A3 г 163	B3 │ 179	C3 ├ 195	D3 ╙ 211	E3 у 227	F3 є 243
04 4	14 20	24 $ 36	34 4 52	44 D 68	54 T 84	64 d 100	74 t 116	84 Д 132	94 Ф 148	A4 д 164	B4 ┤ 180	C4 ─ 196	D4 ╘ 212	E4 ф 228	F4 Ї 244
05 5	15 21	25 % 37	35 5 53	45 E 69	55 U 85	65 e 101	75 u 117	85 Е 133	95 Х 149	A5 е 165	B5 ╡ 181	C5 ┼ 197	D5 ╒ 213	E5 х 229	F5 ї 245
06 6	16 22	26 & 38	36 6 54	46 F 70	56 V 86	66 f 103	76 v 118	86 Ж 134	96 Ц 150	A6 ж 166	B6 ╢ 182	C6 ╞ 198	D6 ╓ 214	E6 ц 230	F6 Ў 246
07 7	17 23	27 ' 39	37 7 55	47 G 71	57 W 87	67 g 103	77 w 119	87 З 135	97 Ч 151	A7 з 167	B7 ╖ 183	C7 ╟ 199	D7 ╫ 215	E7 ч 231	F7 ў 247
08 8	18 24	28 (40	38 8 56	48 H 72	58 X 88	68 h 104	78 x 120	88 И 136	98 Ш 152	A8 и 168	B8 ╕ 184	C8 ╚ 200	D8 ╪ 216	E8 ш 232	F8 ° 248
09 9	19 25	29) 41	39 9 57	49 I 73	59 Y 89	69 i 105	79 y 121	89 Й 137	99 Щ 153	A9 й 169	B9 ╣ 185	C9 ╔ 201	D9 ┘ 217	E9 щ 233	F9 ∙ 249
0A 10	1A 26	2A * 42	3A : 58	4A J 74	5A Z 90	6A j 106	7A z 122	8A К 138	9A Ъ 154	AA к 170	BA ║ 186	CA ╩ 202	DA ┌ 218	EA ъ 234	FA · 250
0B 11	1B 27	2B + 43	3B ; 59	4B K 75	5B [91	6B k 107	7B { 123	8B Л 139	9B Ы 155	AB л 171	BB ╗ 187	CB ╦ 203	DB ▉ 219	EB ы 235	FB √ 251
0C 12	1C 28	2C , 44	3C < 60	4C L 76	5C \ 92	6C l 108	7C | 124	8C М 140	9C Ь 156	AC м 172	BC ╝ 188	CC ╠ 204	DC ▄ 220	EC ь 236	FC № 252
0D 13	1D 29	2D - 45	3D = 61	4D M 77	5D] 93	6D m 109	7D } 125	8D Н 141	9D Э 157	AD н 173	BD ╜ 189	CD ═ 205	DD ▌ 221	ED э 237	FD ¤ 253
0E 14	1E 30	2E . 46	3E > 62	4E N 78	5E ^ 94	6E n 110	7E ~ 126	8E О 142	9E Ю 158	AE о 174	BE ╛ 190	CE ╬ 206	DE ▐ 222	EE ю 238	FE ■ 254
0F 15	1F 31	2F / 47	3F ? 63	4F O 79	5F _ 95	6F o 111	7F △ 127	8F П 143	9F Я 159	AF п 175	BF ┐ 191	CF ╧ 207	DF ▀ 223	EF я 239	FF 255

9.4.11 Code Page 1252

00 0	10 16	20 32	30 0 48	40 @ 64	50 P 80	60 ` 96	70 p 112	80 € 128	90 Not Used 144	A0 NBSP 160	B0 ° 176	C0 À 192	D0 Đ 208	E0 à 224	F0 ð 240
01 1	11 17	21 ! 33	31 1 49	41 A 65	51 Q 81	61 a 97	71 q 113	81 Not Used 129	91 ‘ 145	A1 ¡ 161	B1 ± 177	C1 Á 193	D1 Ñ 209	E1 á 225	F1 ñ 241
02 2	12 18	22 " 34	32 2 50	42 B 66	52 R 82	62 b 98	72 r 114	82 , 130	92 ’ 146	A2 ¢ 162	B2 ² 178	C2 Â 194	D2 Ò 210	E2 â 226	F2 ò 242
03 3	13 19	23 # 35	33 3 51	43 C 67	53 S 83	63 c 99	73 s 115	83 f 131	93 “ 147	A3 £ 163	B3 ³ 179	C3 Ã 195	D3 Ó 211	E3 ã 227	F3 ó 243
04 4	14 20	24 $ 36	34 4 52	44 D 68	54 T 84	64 d 100	74 t 116	84 „ 132	94 ” 148	A4 ¤ 164	B4 ´ 180	C4 Ä 196	D4 Ô 212	E4 ä 228	F4 ô 244
05 5	15 21	25 % 37	35 5 53	45 E 69	55 U 85	65 e 101	75 u 117	85 … 133	95 • 149	A5 ¥ 165	B5 µ 181	C5 Å 197	D5 Õ 213	E5 å 229	F5 õ 245
06 6	16 22	26 & 38	36 6 54	46 F 70	56 V 86	66 f 103	76 v 118	86 † 134	96 – 150	A6 ¦ 166	B6 ¶ 182	C6 Æ 198	D6 Ö 214	E6 æ 230	F6 ö 246
07 7	17 23	27 ' 39	37 7 55	47 G 71	57 W 87	67 g 103	77 w 119	87 ‡ 135	97 — 151	A7 § 167	B7 · 183	C7 Ç 199	D7 × 215	E7 ç 231	F7 ÷ 247
08 8	18 24	28 (40	38 8 56	48 H 72	58 X 88	68 h 104	78 x 120	88 ˆ 136	98 ˜ 152	A8 ¨ 168	B8 ¸ 184	C8 È 200	D8 Ø 216	E8 è 232	F8 ø 248
09 9	19 25	29) 41	39 9 57	49 I 73	59 Y 89	69 i 105	79 y 121	89 ‰ 137	99 ™ 153	A9 © 169	B9 ¹ 185	C9 É 201	D9 Ù 217	E9 é 233	F9 ù 249
0A 10	1A 26	2A * 42	3A : 58	4A J 74	5A Z 90	6A j 106	7A z 122	8A Š 138	9A š 154	AA ª 170	BA º 186	CA Ê 202	DA Ú 218	EA ê 234	FA ú 250
0B 11	1B 27	2B + 43	3B ; 59	4B K 75	5B [91	6B k 107	7B { 123	8B ‹ 139	9B › 155	AB « 171	BB » 187	CB Ë 203	DB Û 219	EB ë 235	FB û 251
0C 12	1C 28	2C , 44	3C < 60	4C L 76	5C \ 92	6C l 108	7C | 124	8C Œ 140	9C œ 156	AC ¬ 172	BC ¼ 188	CC Ì 204	DC Ü 220	EC ì 236	FC ü 252
0D 13	1D 29	2D - 45	3D = 61	4D M 77	5D] 93	6D m 109	7D } 125	8D Not Used 141	9D Not Used 157	AD SHY 173	BD ½ 189	Í 205	DD Ý 221	ED í 237	FD ý 253
0E 14	1E 30	2E . 46	3E > 62	4E N 78	5E ^ 94	6E n 110	7E ~ 126	8E Ž 142	9E ž 158	AE ® 174	BE ¾ 190	Î 206	DE Þ 222	EE î 238	FE þ 254
0F 15	1F 31	2F / 47	3F ? 63	4F O 79	5F _ 95	6F o 111	7F △ 127	8F Not Used 143	9F Ÿ 159	AF ¯ 175	BF ¿ 191	Ï 207	DF ß 223	EF ï 239	FF ÿ 255

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	—0	—1	—2	—3	—4	—5	—6	—7	—8	—9	—A	—B	—C	—D	—E	—F
0–	NUL 0000	SOH 0001	STX 0002	ETX 0003	EOT 0004	ENQ 0005	ACK 0006	BEL 0007	BS 0008	HT 0009	LF 000A	VT 000B	FF 000C	CR 000D	SO 000E	SI 000F
1–	DLE 0010	DC1 0011	DC2 0012	DC3 0013	DC4 0014	NAK 0015	SYN 0016	ETB 0017	CAN 0018	EM 0019	SUB 001A	ESC 001B	FS 001C	GS 001D	RS 001E	US 001F
2–	SP 0020	! 0021	« 0022	# 0023	$ 0024	% 0025	& 0026	‘ 0027	(0028	) 0029	* 002A	+ 002B	, 002C	- 002D	. 002E	/ 002F
3–	0 0030	1 0031	2 0032	3 0033	4 0034	5 0035	6 0036	7 0037	8 0038	9 0039	: 003A	; 003B	< 003C	= 003D	> 003E	? 003F
4–	@ 0040	A 0041	B 0042	C 0043	D 0044	E 0045	F 0046	G 0047	H 0048	I 0049	J 004A	K 004B	L 004C	M 004D	N 004E	O 004F
5–	P 0050	Q 0051	R 0052	S 0053	T 0054	U 0055	V 0056	W 0057	X 0058	Y 0059	Z 005A	[005B	\ 005C	] 005D	^ 005E	_ 005F
6–	` 0060	a 0061	b 0062	c 0063	d 0064	e 0065	f 0066	g 0067	h 0068	i 0069	j 006A	k 006B	l 006C	m 006D	n 006E	o 006F
7–	p 0070	q 0071	r 0072	s 0073	t 0074	u 0075	v 0076	w 0077	x 0078	y 0079	z 007A	{ 007B	| 007C	} 007D	~ 007E	⌂ 2302
8–	€ 20AC		‘ 201A	ƒ 192	„ 201E	… 2026	† 2020	‡ 2021		‰ 2030		‹ 2039				
9–		‘ 2018	’ 2019	“ 201C	” 201D	• 2022	– 2013	— 2014		™ 2122		› 203A				
A–	A0	΅ 385	Ά 386	£ A3	¤ A4	¥ A5	¦ A6	§ A7	¨ A8	© A9		« AB	¬ AC	AD	® AE	― 2015
B–	° B0	± B1	2 B2	3 B3	΄ 384	µ B5	¶ B6	· B7	Έ 388	Ή 389	Ί 38A	» BB	Ό 38C	½ BD	Ύ 38E	Ώ 38F
C–	ΐ 390	Α 391	Β 392	Γ 393	Δ 394	Ε 395	Ζ 396	Η 397	Θ 398	Ι 399	Κ 39A	Λ 39B	Μ 39C	Ν 39D	Ξ 39E	Ο 39F
D–	Π 3A0	Ρ 3A1		Σ 3A3	Τ 3A4	Υ 3A5	Φ 3A6	Χ 3A7	Ψ 3A8	Ω 3A9	Ϊ 3AA	Ϋ 3AB	ά 3AC	έ 3AD	ή 3AE	ί 3AF
E–	ΰ 3B0	α 3B1	β 3B2	γ 3B3	δ 3B4	ε 3B5	ζ 3B6	η 3B7	θ 3B8	ι 3B9	κ 3BA	λ 3BB	μ 3BC	ν 3BD	ξ 3BE	ο 3BF
F–	π 3C0	ρ 3C1	ς 3C2	σ 3C3	τ 3C4	υ 3C5	φ 3C6	χ 3C7	ψ 3C8	ω 3C9	ϊ 3CA	ϋ 3CB	ό 3CC	ύ 3CD	ώ 3CE	

10 SELF TEST TICKET DESCRIPTION

The self test ticket can be printed by pressing both Reset and Paper feed button and releasing the Reset button.
Or disconnected power supply, wait ~3 seconds, reconnected power supply with paper feed button pressed.

Nota:
To selected the mode to start printing “self test ticket”, see hexadecimal command “1F 03 DA n “.
You can also selected the type of ticket “Self test ticket” or “Diagostic Form ticket”, see hexadecimal “1F 03 DB n”.

10.1 Self Test ticket

Here is the description of all the lines that you can read when you print a self test.
During the self test, the printer is offline.

*** SELF TEST ***		
Model number	: TRITON	- This is a 15 digit number fixed by AXIOHM.
Serial number	: 0000000000	- This is a 10 digits number fixed by AXIOHM. (see definition below)
Revision nbr	: 0000000000	- This is a 10 digits number. Settable by user.
Version (Rev_Crc):	02.00_FC38	- Identify main program layer fixed by AXIOHM (revision_CRC).
Comm. Interface	: RS232	- Communication interface selected (RS232 or USB).
Configuration	: 115200,n,8,1	- This is a RS232 or USB setting parameters.
Rx Buffer Size	: 4096 Bytes	- This indicates the size of the data Input buffer (in bytes).
Paper Type	: POS CLASS	- Indicates the reference of the paper used.
Density	: 100 %	- Percentage of the nominal heating time value.
Multi-heat Mode	: Off	- Indicates the status of multi-heat mode.
Max. Speed	: 250 mm/sec	- Printer top speed limit.
Default Font	: 12x24	- Indicates default font selected upon reset.
Code Page	: 437	- Indicates default code page selected upon reset.
Press and hold Paper Feed Button One second after printing Self-Test to Enter Sub-menus		- How enter to Sub Menu.
Ready.		

1.1. Sub –Menus ticket

During the Sub-Menus execution, the printer is offline (Busy Mode).

Select Code Number :
- EXIT → 1 click
- Self-Test → 2 clicks
- Print Diagnostic → 3 clicks

- Short click : Feed Button is quickly pressed then released.

- Long click : Feed Button is held down more than 1 second then released.

Enter Code Number [Sort click], and validate [Long click].

10.2 Diagnostic Form ticket

During the “Diagnostic Form ticket” execution, the printer is offline (Busy Mode).

**** Diagnostics Form ****

- Reference Number -			
Model	:	TRITON 80	- This is a 15 digit number fixed by AXIOHM.
Serial	:	0000000000	- This is a 10 digits number fixed by AXIOHM. First letter: always D Next two digits: year of production Next two digits: week of production Next 5 digits: incremental number that is reset every Monday morning.
Revision	:	0000000000	- This is a 10 digits number. Settable by user.
- Firmware (Id_Rev_Crc) -			- Printer firmware Identification,_Revision_CRC
Boot Strap	:	7300498_02.07_0801	- Identify boot Strap layer fixed by AXIOHM.
Boot Loader	:	7300498_02.23_1355	- Identify boot Loader layer fixed by AXIOHM.
Client	:	7300499_03.28_91C8	- Identify main program layer fixed by AXIOHM.
- Hardware -			
Board Id.	:	3110774	- Electronic board identification number fixed by AXIOHM.
CPU Clock Freq.	:	120 MHz	- Microprocessor Clock frequency.
Flash Size (Kbytes)	:	512	
RAM Size (Kbytes)	:	128	
Max Power	:	75 W	- Maximum average power drawn from power supply.
Voltage	:	+24V	- Board Voltage.
Low Voltage Detector	:	On	- Status of low voltage security (stop printing if voltage under x,xxV). See Code (1F03 91 m).
System Watchdog	:	On	- Status system watchdog.
Eeprom Rev.	:	0.002	- Non Volatile memory firmware revision.
.Cluster Erasing	:	00001	- Indicates the number of cluster initialization.
- User Flash storage (Kbytes) -			
Max. Sector Size	:	64 + 128	- Indicates the maximum size Flash User in Kb. See code sector allocation (1D 22 55 n1 n2).
Logos/Fonts sector	:	64	- Size Kb (Modulo 64/ 128K). Reserved for user defined logos or user defined fonts.
User Data Sector	:	0	- Size Kb (Modulo 64/ 128K). Reserved for user defined (Ex: electronic journal).
EasyFont Sector	:	128	- Size Kb (Modulo 64/ 128K). Reserved for Easy Font format (Ex: Asian font).
- Mechanism parameters -			
Type	:	MGTA	- Indicates the mechanism series.
Paper Type	:	POS CLASS	- Indicates the reference of the paper used matching with the mechanism.
Paper Width	:	80 mm	- Indicated the paper width used.
Print Density	:	100 %	- Percentage of the nominal heating time value for specified paper. See code (1F 0B 4E 52 4A n) or (1D 4E n).
Power Supply	:	23.76V	- Result of current voltage measurement.
- Multi-Heat Mode	:	Off	- Status of multi-heat mode. See code (1D 25 s n0 n1).
Number dots max.	:	256	- Printed only if multi-heat mode selected (On). [xx≤Number dots≤xxx].
Number heats max.	:	02	- Printed only if multi-heat mode selected (On). [Xx≤Number Heats≤xx].
Min. Speed (mm/s)	:	xx.00	- Printed only if multi-heat mode selected (On). Printing top low speed.
Max. Speed (mm/s)	:	250.00	- Printer top speed limit. See code (1F 0C 53 50 46 nL nH).
Pre-Heat Head	:	Off	- This mode is used to maintain print head temperature above minimum value.
Knife	:	On	- Enable Knife Operation.
Min. Ticket Length	:	65 mm	- This value indicates the minimum ticket length.
Paper Entry	:	Bottom	- Select which paper entry used.
Paper Auto load Mode	:	On	- Set Paper Auto load Mode.
Steps Auto load	:	1600	- Indicate the number of motor steps for auto-Load.
- Motor Parameters	:		
Paper Feed motor	:	696.0 mA	- Indicated the maximum current driver (in mA) for paper feed motor.
Pwm (Cyc./Period)	:	55/120	- Select current reference.
Hold Motor Mode	:	Off	- Indicate state of hold motor management.
Knife motor	:	494.0 mA	- Indicated the maximum current driver (in mA) for cutter motor.
Pwm (Cyc./Period)	:	39/120	- Select current reference.
Presenter motor	:	405.0 mA	- Indicated the maximum current driver (in mA) for presenter motor.
Pwm (Cyc./Period)	:	32/120	- Select current reference.

- Detection Sensor:		
Paper Low Mode:	Off	- Enable/Disable Paper low sensor management. See code (1F 03 03 m)
Top Of Form Mode:	Off	- Enable/Disable Top Of Form sensor management. See code (1F 03 87 m)
Door Open Mode:	On	- Enable/Disable Door sensor management. See code (1F 03 89 m)
Presenter Mode :	On	- Enable/Disable Presenter sensor management. See code (1F 03 81 m)
Paper Jam Mode:	Off	- Enable/Disable Paper Jam sensor management. See code (1F 03 88 m)
Assign /Threshold:		- See code (1F 03 13 n0 … n5) / (1D 73 n m)
Paper Out :	J6-2/144	- Indicate hardware connector assignment (n0) / Indicate Paper out threshold.
Paper Low :	J7-3/128	- Indicate hardware connector assignment (n1) / Indicate Paper low threshold.
Top Of Form :	J6-2/100	- Indicate hardware connector assignment (n2) / Indicate Top of Form threshold.
Cover Open :	J6-5/128	- Indicate hardware connector assignment (n5) / Indicate Cover open threshold.
Paper Jams :	*J8-5/100*	- Indicate hardware connector assignment (n3) / Indicate Paper Jam threshold.
Auxiliary :	*J8-6/128*	- Indicate hardware connector assignment (n4) / Indicate Auxiliary threshold.
Presenter Input :	J8-5/170	- Indicate hardware connector assignment (n3) / Indicate Presenter input threshold.
Presenter Output:	J8-6/44	- Indicate hardware connector assignment (n4) / Indicate Presenter output threshold.
Sensor Current :		
Cmd Sensor J6-3:	18.21 mA	- Indicate the current command on the sensor connector J6-3.
Pwm (Cyc./Period):	92/100	- Select current reference.
- Top Of Form mode:		- Printed only if Top Of Form sensor management selected (On).
Mode :	*On*	- Top Of Form activated – See Code (1F 03 87 n).
TOF paper saving:	*Off*	- Modification printing line started. See code (1F 03 D7 nL nH).
- Distance (mm) :		
Print Line to Cut:	*9.8*	- Mechanism distance (MGTA). See Code <1F 03 8B nL nH>.
Sensor to Cut :	*25.2*	- Mechanism distance when no use Auxiliary sensor else see code (1F 03 D2 nL nH).
Ticket Length :	*101.0*	- Ticket length = start mark to start mark next ticket.
Offset Cut :	*0.0*	- Used to define the paper saving distance. See Code (1F 03 D7 nL nH).
TOF to Print Line:	*89.2*	-
Offset TOF Mark:	*0.0*	- Adjusting the start position of the mark to make the measurement. See code (1F 03 8E n).
TOF Mark to Cut:	*99.0*	- Distance Mark to cut line you want. See code (1F 03 99 nL nH)
TOF Add. Search:	*10.0*	- Addition distance to search Mark. See code (1F 03 97 nL nH).
- Presenter :		- Printed only if Presenter sensor management selected (On).
Max. Speed :	450 mm/s	- Indicate presenter motor output paper (in mm/s).
Prehension Dist.:	10 mm	- Indicate waiting distance (in mm). After paper is detected in input presenter sensor.
Loop Height :	60 mm	- Indicate The maximum loop Length in presenter (in mm).
Error, 2nd try :	Disabled	- Indicate if 2nd try with error option is disabled or enabled.
Retain Option :	Enabled	- Indicate if retain option is enabled or disabled.
Retract Option :	Enabled	- Indicate if retracted option is enabled or disabled.
Wait Delay :	2 s	- Time out to retract ticket's (in second), Only printed if Retract option is enabled.
Wait Next Ticket :	Disabled	- Indicate if wait next print for retract is disabled or enabled. Only printed if Retract active.
- Communication Interface -		
Packet Protocol :	Disabled	Indicates if the packet protocol is enabled or not.
Fault recovery :	Automatic	-Indicated whether printer restarts automatically when a fault condition disappears or if an action from the host is required. See code (1F 03 90 m)
USM Mode :	Disabled	- Indicate if Unsolicited Status Mode management is enabled or not. See code (1D 61 n).
USM Count Mode :	Disabled	- Indicate Count mode management is enabled or not, into Unsolicited Status Mode.
Rx Buffer Size :	4096	- This indicates the size of the data Input buffer (Bytes).See Code (1F 0A 52 3D n)
Comm. Interface :	RS232	- Indicates if RS232 or USB interface is used. Automatic detection of USB interfaces.
- Parameters RS232:		
Baud Rate :	115200	- Indicate baud rate value.
Data Bits :	8	- Indicate number of data bits.
Stop Bit(s) :	1	- Indicate number of stop bit(s).
Parity :	No	- Type of parity to control frame validity.
- Flow Control :		
Type :	DTR/DSR	- Hardware or Software handshaking.
Pause :	3584 bytes	- Buffer receive limit. Printer Send xOff or change DTR line.
Restart :	3072 bytes	- Buffer receive limit. Printer Send xOn or change DTR line.
Reception Error :	Ignore	- Indicate which action is being done when a wrong data is received.
Break Detection :	Enabled	- Indicate Break detection line status. Enabled → Low level on RX line during xx ms ➔ Set Printer Reset.
- Parameters USB:		
Number of Endpoint:	4	- Printer USB Interface, number of end points. See code (1F 02 03 p1…p6).
Driver Easy Mode:	Disabled	- Driver Easy Mode On/Off Status. See code (1F 03 D3 n).

- Print Options -			
Diagnostics	:	Off	- See code (1F 03 00 n).This line indicates in which mode the board is : - Off corresponds to a standard mode - Data Scope is used to print data in ASCII and HEX format received from the host. - Demo mode.
Default LPI	:	7.52	- Default inter-lines spacing. See code (1F 03 94 m).
Carriage Return	:	Ignored	- Select how to process a 0DH character received from the host. See code (1F 03 94 m).
Logo(s) defined	:	No	- Current status = YES if at least one logo is defined.
User Char(s) def.	:	No	- Current status = YES if at least one character is defined
- Fonts -			
Default	:	12*24	- Indicates default font (Resident/User/EasyFont) selected upon reset. See Code (1F 03 0F m).
Resident	:	12*24, 16*24	- List of internal fonts.
- Code Page -			
Default	:	437	- Indicates default code page (resident/ EasyFont) selected upon reset. See Code (1F 03 80 n).
Swap A, B, C fonts:		Off	- Modification standard font defined.
Resident	: : : : : : :	437, 737, 850, 852, 858, 860, 862, 863, 865, 866, 1252,1253, Katakana	- List of internal codes pages.
EasyFont Defined	:	No	- Current status = YES if at least one character font is defined.
- User Tallies - (1)			Tallies printed = Current counter value / Not the NVM value (1).
Max Temp Reached	:	43.61	- Indicate the maximum temperature (in C degrees) reached by the print head.
Cover Openings	:	3	- Indicate the number of cover opening/closed cycles.
Knife Cuts	:	41	- indicate the number of cuts performed.
Lines written	:	2468	- Indicate the number of text line s printed.
Flash cycles	:	3	- Indicate the number of flash memory download cycles.
Hours On	:	22	- Indicate the number of hours the board has been turned On.
Knife Jams	:	0	- Indicate the number of times that cutter jam appeared.
Meter Print	:	14	- Indicate the number of paper meters printed.
Reboot Device	:	46	- Indicate the number of time that the controller board had been reset.
Retracted Tickets	:	13	- Printed only if Presenter sensor selected (On). Indicate the number of ticket retracted.
Taken Tickets	:	28	- Printed only if Presenter sensor selected (On). Indicate the number of ticket taken.
Head Damaged	:	NO	- Indicate if the print head is damaged or not.

Note: (1) tallies are updated every 1/2hour or 1000 lines printed, whichever comes first.

For further information, please contact your distributor or Axiohm Technical Support Team at ***www.axiohm.com***

11 COMMANDS SORTED BY FUNCTION

11.1 Reset Commands

Code ASCII	Code Hexadecimal	Description	Page
DLE	**10**	Initialize Printer.	**91**
ESC @	**1B 40**	Initialize Printer.	**114**
GS (SPACE)	**1D FF**	Reboot Printer.	**172**

11.2 Vertical Positioning and Print Commands

The vertical positioning and print commands control the vertical print positions of characters on the receipt.

Code ASCII	Code Hexadecimal	Description	Page
LF	**0A**	Print and Feed One Line.	**89**
CR	**0D**	Activate Carriage Return.	**90**
DC4 n	**14** *n*	Feed *n* Print Lines.	**99**
NAK n	**15** *n*	Feed *n* Dot Rows.	**99**
SYN n	**16** *n*	Add *n* Extra dot Rows.	**100**
ETB	**17**	Print One Line.	**100**
ESC SP n	**1B 20** *n*	Set Right-Side Character Spacing.	**103**
ESC 2	**1B 32**	Set Line Spacing to 1/6 inch.	**111**
ESC 3 n	**1B 33** *n*	Set Line Spacing.	**111**
ESC J n	**1B 4A** *n*	Print and Feed Paper.	**117**
ESC d n	**1B 64** *n*	Print and Feed *n* Lines.	**126**

11.3 Horizontal positioning Commands

The horizontal positioning commands control the horizontal print positions of characters on the receipt.

Code ASCII	Code Hexadecimal	Description	Page
HT	**09**	Horizontal Tab.	**89**
ESC DC4 n	**1B 14** *n*	Set Column.	**102**

ESC $ n1 n2	**1B 24** *n1 n2*	Set Absolute Starting Position.	**105**
ESC D [n]…k NUL	**1B 44** *[n]…k NUL*	Set Horizontal Tab Positions.	**115**
ESC \ nL nH	**1B 5C** *nL nH*	Set relative Print Position.	**124**
ESC a n	**1B 61** *n*	Select Justification.	**125**
GS L nL nH	**1D 4C** *nL nH*	Set Left Margin.	**154**
GS P x y	**1D 50** *x y*	Set Horizontal and Vertical Minimum Motion Units.	**155**
GS W nL nH	**1D 57** *nL nH*	Set Printing Area Width.	**157**

11.4 Print Characteristic Commands

These commands control what the printed information looks like, selection of character sets, definition of custom-defined characters, and setting of margins. The commands are described in order of their hexadecimal codes.

Code ASCII	Code Hexadecimal	Description	Page
DC2	**12**	Select Double –Wide Characters.	**98**
DC3	**13**	Select Single-Wide Characters.	**99**
ESC DC2	**1B 12**	Select 90 Degree Counter-Clockwise Rotated Print.	**102**
ESC ! n	**1B 21** *n*	Select Print Mode.	**104**
ESC – n	**1B 2D** *n*	Select or Cancel Underline Mode.	**109**
ESC E n	**1B 45** *n*	Select or cancel Emphasized Mode.	**115**
ESC G n	**1B 47** *n*	Select or cancel Double Strike.	**116**
ESC I n	**1B 49** *n*	Select or cancel Italic Print.	**116**
ESC V n	**1B 56** *n*	Select or Cancel 90 Degree Clockwise Rotated print.	**121**
ESC { n	**1B 7B** *n*	Select or cancel Upside –Down Print Mode.	**128**
GS! n	**1D 21** *n*	Select Character Size.	**139**
GS B n	**1D 42** *n*	Select Or Cancel White/Black Reverse Print Mode.	**149**
US ENQ n	**1F 05** *n*	Select Superscript or Subscript Modes.	**203**

Summary of Rotated Printing

The table shows the combinations of upside-down print, 90 degree clockwise rotated print, and 90 degree counterclockwise rotated print.

90 degree clockwise rotated and 90 degree counterclockwise rotated print commands are mutually exclusive: The setting of the last received command is effective.

The samples of the print show only the normal size characters. Double-wide and double-high characters are printed in the same orientation. They may also be mixed on the same line.

Upside Down **1B 7B *n***	Rotated CW **1B 56 *n***	Rotated CCW **1B 12**	Resulting Output
Canceled	Canceled	Canceled	1 (See Below)
Canceled	Set	Canceled	2 (See Below)
Set	Canceled	Canceled	3 (See Below)
Set	Set	Canceled	4 (See Below)
Canceled	Canceled	Set	5 (See Below)
Set	Canceled	Set	6 (See Below)

1. ABC **2.** ∀ꓭƆ **3.** ƆꓭV **4.** ƆꓭA **5.** ∀ꓭƆ **6.** Ɔꓭ∀

Note: Right-side up and upside down print modes cannot be mixed on the same line.

11.5 Font Commands

Code ASCII	Code Hexadecimal	Description	Page
ESC SYN n	**1B 16** *n*	Select pitch (Column Width).	**103**
ESC % n	**1B 25** *n*	Select Character Set.	**105**
ESC & s c1 c2 n1 d1 … dn	**1B 26** *s c1 c2 n1 …*	Define User-Defined Character Set.	**106**
ESC : 0 0 0	**1B 3A** *30 30 30*	Copy Character Set from Rom to Ram.	**112**
ESC R n	**1B 52** *n*	Select International Character Set.	**119**
ESC t n	**1B 74** *n*	Select Page Code or Active User-defined Font Select.	**126**
GS H n	**1D 42** *n*	Select or Cancel White /Black Reverse Print Mode.	**149**
US & H cn cm ln [dnk]…lm [dmk]	**1F 26 48** *cn cm ln …*	Define User-Defined Character Set with variable Height.	**224**
US F n	**1F 46** *n*	Select Font User.	**230**
US i n	**1F 69** *n*	Select Active User-Defined Character.	**233**
US k	**1F 6B**	Upload Font.	**234**
US z n	**1F 7A** *n*	Return User Font Status.	**239**

11.6 Easy Font Commands

The downloadable fonts are stored in Flash memory in a dedicated area, separate from the code and usual logos and user font's storage areas.

Code ASCII	Code Hexadecimal	Description	Page
FS F t	**1C 46** *t*	**Read Font information.**	**128**

FS H	**1C 48**	**Check Easy Font Compatibility.**	**129**
FS L f8 t w n {d}	**1C 4C** *f8 t w n {d}*	**Download Single Byte Font.**	**130**

11.7 Graphics Commands

These commands are used to enter and print graphics data and are described in order of their hexadecimal codes.

Code ASCII	Code Hexadecimal	Description	Page
DC1 n1 ...nl	**11** *n1 ...nl*	Print Raster Graphics (GFX).	**98**
*ESC * m n1 n2 d1 ... dn*	**1B 2A** *m n1 n2 d1 ...*	Select Bit Image Mode.	**107**
ESC . m nrL rH d1 ... dn	**1B 2E** *m n rL rH ...*	Advanced Raster graphics.	**110**
ESC K n1 n2 d1 ... dn	**1B 4B** *n1 n2 d1 …*	Select Single Density Graphics.	**117**
ESC Y n1 n2 d1 … dn	**1B 59** *n1 n2 d1 …dn*	Select Double-Density Graphics.	**123**
GS v 0 m xl xh yl yh d1 … dk	**1D 76 30** *m xl xh …*	Print Raster Bit Image.	**170**
US LF ï n	**1F 0A 8B** *n*	Set GFX Print Area Width.	**215**
US FF S P B n	**1F 0C 53 50 45** *nL nH*	Select Maximum Print speed before print GFX	**219**
US B M P [file]	**1F 42 4D 50** *[file]*	Print a BMP File.	**229**
US y n	**1F 79** *n*	Set Low Resolution Raster Graphics.	**239**

11.8 Logo Commands

Code ASCII	Code Hexadecimal	Description	Page
ESC B M P [File]	**1B 42 4D 50** *[File]*	Download BMP Logo.	**114**
GS # n	**1D 23** *n*	Select the Current Logo.	**143**
*GS * n1 n2 d1 … dn*	**1D 2A** *n1 n2 d1…dn*	Define Download Bit Image.	**146**
GS / m	**1D 2F** *m*	Print Download Bit Image.	**147**
US e n	**1F 65** *n*	Return Logo Checksum.	**233**
US j	**1F 6A**	Upload Logo.	**234**

11.9 Printer Status Commands

These commands enable the printer to communicate with the host computer. They are stored in the printer's data buffer as they are received, and are handled by the firmware in the order in which they were received.

When a fault occurs, the printer will go busy at the communication interface and not respond to either of the Printer Status commands. If the fault causing the busy condition can be cleared, such as by loading paper, or letting the thermal printhead cool down, the printer will resume processing the data in its receive buffer.

Real Time commands allow the printer to function when it is busy at the communication interface. See the following section, Real Time Commands, for details about these commands.

Code ASCII	Code Hexadecimal	Description	Page
ESC v	**1B 76**	Transmit Paper Sensor status	**127**
GS LF n	**1D 0A n**	Return Hardware Information.	**135**
GS I n	**1D 49** *01 or 31*	Transmit *Printer Model ID*.	**150**
GS I n	**1D 49** *02 or 32*	Transmit *Type ID*.	
GS I @ +	**1D 49 40** *2B*	Return *Boot firmware part number*.	**151**
GS I @ 3	**1D 49 40** *33*	Return *Client firmware part number*.	
GS I B	**1D 49** *42*	Transmit *Printer Manufacturer*.	**150**
GS I C	**1D 49** *43*	Transmit *Printer Name*.	
GS I D	**1D 49** *44*	Transmit *Serial Number*.	
GS a n	**1D 61** *n*	Select or Cancel unsolicited status Mode (USM).	**160**
GS I m	**1D 6C** *m*	Transmit Selected Sensor A/D Value.	**165**
GS s n	**1D 72** *n*	Transmit status (Paper Sensor, Flash Memory User Sector Status).	**166**
US LF ä	**1F 0A** *84*	Read *Voltage Monitoring*.	**214**
US LF à	**1F 0A** *85*	Read *Temperature Monitoring*.	
US V	**1F 56**	Send Printer Software Version	**230**
US v n	**1F 76** *n*	Buffered status transmission	**235**

11.10 Real Time Commands

The Real Time commands provide an application interface to the printer even when the printer is not handling other commands.

- Real Time Status Transmission: GS (Hex 1D) Sequence and DLE (Hex 10) Sequence.
- Real Time Request to Printer: GS (Hex 1D) Sequence and DLE (Hex 10) Sequence.
- Real Time Printer Status Transmission.

The original Printer Status commands, Transmit Printer Status (Hex 1B 76, ASCII ESC v) are placed in the printer's data buffer as they are received and handled by the firmware in the order in which they were received. If the paper exhausts while printing data that was in the buffer ahead of the status command, the printer goes busy at the communication interface and suspends processing the data in the buffer until paper is reloaded. This is true for all error conditions: knife home error, thermal printhead overheat, etc. In addition, there is no way to restart the printer after a paper jam or other error.

The Real Time commands are provided to overcome these restrictions.

Rules for Using Real Time Commands

RS232 interface

Three situations must be understood when using real time commands :
1) The printer executes the Real Time command upon receiving it and will transmit status regardless of the condition of the host being ready to receive or not.

2) The printer transmits status whenever it recognizes a Real Time Status Transmission command sequence, even if that sequence happens to occur naturally within the data of another command, such as graphics data.
In this case the sequence will be processed both ways : as a real time command and as the graphics data it is intended to be when the graphics command is executed from the buffer. The result is that the host might receive status messages it has not requested.

3) If the printer is in error condition, meaning that the communication interface is likely to be busy, the host must be able to send the real time commands regardless of this busy state at the interface. Otherwise those commands wouldn't be received and processed.

These three situations generally preclude use of standard DOS drivers for the serial communication ports when using real time commands.

Applications should not let the buffer fill up with Real Time commands when the printer is busy at the communication interface. A busy condition can be determined by bit 3 of the response to GS ENQ or GS EOT 1 or DLE EOT 1. The reason for a particular busy condition can be determined by other responses to GS EOT n or DLE EOT n.
Although the printer responds to Real Time commands when it is busy, it will place them into the buffer behind any other data there, and flush them out in the order in which they were received. When the printer is busy due simply to buffer full (that is, it can't print data as fast as it can receive it), then data continues to be processed out of the buffer at approximately print speed and the Real Time commands will eventually get flushed out.

When the printer is busy due to an error condition, then data stops being processed of the buffer until the condition clears one way or another. In either case, but more quickly in the case of an error condition, the buffer can fill with Real Time commands.
When the DLE sequences are being used, the last byte stored when the buffer fills up could be the DLE code, with no room for the subsequent EOT or ENQ. When this lone DLE byte is finally processed out of the buffer it will be interpreted as a Clear Printer command.
Similarly, when the GS sequences are being used, the last byte stored when the buffer fills up could be the GS code, with no room for the subsequent EOT or ETX or ENQ. When this lone GS byte is finally processed out of the buffer it will use the next byte, whatever it is, as the second byte in its GS sequence.
To guard against this situation, the application must determine the cause of a busy condition and take appropriate action or pace the Real Time commands to avoid filling the buffer. There is a minimum of 256 bytes available in the printer's buffer when it goes busy.

USB interface

USB interface Real time commands are sent on a specific endpoint 0x01 (INTERRUPT OUT), so that those commands are not mixed with the main command stream carried on endpoint 0x02 (BULK OUT).
Responses to real times commands are transmitted back to the host on endpoint 0x82 (BULK IN) or 0x81 (INTERRUPT IN). See command US STX *n1… n6* (Hex 1F 02…) set tree of four end points.

Summary of USB End Point for Real Time Commands

Command[2] (1F 02 *n1 …n6)* Number of End Points	Command[2] (1F 03 D3 *n)* Easy Driver	End Point for Real Time Command Received		Reply
4	Canceled	Interrupt Out [1]	➔	Interrupt In
4	Set	Interrupt Out	➔	Interrupt In
		Bulk Out	➔	Bulk In
3	Canceled	BulkOut	➔	Interrupt In
3	Set	Bulk Out	➔	Bulk In

[1] Default Value.
[2] Configuration command.

Busy Line and Fault Conditions

If the printer is in error condition (cover is open, paper is exhausted…), the printer will still accept data, respond to the batch mode status commands (ESC v and ESC u) and not go busy until it actually tries to execute a print command. Then it will stay busy and stop processing data out of the receive buffer until the condition clears. It will respond to the Real Time commands as described below.

Recognizing data status from the printer

An application sending various real time and non-real time commands to which the printer responds can determine which command a response belongs to by the table below.

		Status type		Reply Byte in bit binary							
Ascii	**Hex**	**Normal**	**Real time**	**7**	**6**	**5**	**4**	**3**	**2**	**1**	**0**
ESC v	1B 76	o	-	0	x	x	0	x	x	x	x
GS LF *n*	1D 0A *n*	o	-	0	x	x	0	x	x	x	x
GS I SOH	1D 49 *02*	o	-	0	x	x	0	x	x	x	x
GS r *n*	1D 72 *n*	o	-	0	x	x	0	x	x	x	x
US v *n*	1F 76 *n*	o	-	0	x	x	0	x	x	x	x
DLE EOT *n*	10 04 *n*	-	o	0	x	x	1	x	x	1	0
DLE EOT v	10 04 *76*	-	o	0	x	x	0	x	x	x	x
DLE ACK	10 06	-	o	0	x	x	0	x	x	x	x
DLE EM *n*	10 19 *n*	-	o	1	x	x	0	x	x	x	x
GS EOT *n*	1D 04 *n*	-	o	0	x	x	1	x	x	1	0
GS ENQ	1D 05	-	o	1	x	x	1	x	x	x	x
Unsolicited status mode (USM) Response recognized by:											
USM byte 1	-	-	o	0	x	x	1	x	1	x	x
USM byte 2-5	-	-	o	0	x	x	0	x	x	x	x
RS232 Protocol Xon-Xoff:											
Xon	11	-	o	0	0	0	1	0	0	0	1
Xoff	13	-	o	0	0	0	1	0	0	1	1

Table of Real Time Commands

Code ASCII	Code Hexadecimal	Description	Page
DLE EOT SOH	**10 04** *01*	Real Time Status Transmit *Printer status.*	**92**
DLE EOT STX	**10 04** *02*	Real Time Status Transmit *Offline status.*	
DLE EOT ETX	**10 04** *03*	Real Time Status Transmit *Error status.*	
DLE EOT EOT	**10 04** *04*	Real Time Status Transmit *receipt paper status.*	
DLE EOT v	**10 04** *76*	Real Time Status *Transmit Paper Status*.	
DLE ENQ STX	**10 05** *02*	Real Time Recovery from fault.	**94**
DLE ACK	**10 06**	Real time *Current position count transmission* (USM).	**95**
DLE EM NULL	**10 19** *00*	Extended real time *Memory Allocation*.	**96**
DLE EM SOH	**10 19** *01*	Extended real time *Printer Status*.	
DLE EM STX	**10 19** *02*	Extended real time *Error Status.*	
DLE EM ETX	**10 19** *03*	Extended real time *No defined* reply one byte *= 80h.*	
DLE EM EOT	**10 19** *04*	Extended real time *Environmental status.*	
DLE EM ENQ	**10 19** *05*	Extended real time *Print Buffer Status.*	
DLE EM ACK	**10 19** 06	Ext. real time *COM port Receive Buffer Status.*	
DLE EM BEL	**10 19** *07*	Ext. real time *Print Commands Processings.*	
DLE EM BS	**10 19** *08*	Ext. real time *Clear Counter Of Print Command.*	
DLE EM HT	**10 19** *09*	Ext. *Clear SRAM & FLASH Memory Allocation Error.*	
DLE EM LF	**10 19** *0A*	Extended real time *Printer Serial Number.*	
DLE EM VT	**10 19** *0B*	Extended real time *Printer Software Revision.*	
DLE EM NP	**10 19** *0C*	Extended real time *Model Number.*	
GS ETX n	**1D 03** *n*	Real time recovery from Fault (**same 10 05** *n*).	**132**
GS EOT SOH	**1D 04** *01*	Real Time Status Transmit *Printer Status* (**Same 10 04** *01*).	**132**
GS EOT STX	**1D 04** *02*	Real Time Status Transmit *Offline Status* (**Same 10 04** *02*).	
GS EOT ETX	**1D 04** *03*	Real Time Status Transmit *Error status* (**Same 10 04** *02*).	
GS EOT EOT	**1D 04** *04*	Real Time Transmit *Receipt Paper Status* (**Same 10 04** *04*).	
GS EOT v	**1D 04** *76*	Real Time Status Transmit *Paper Status* (**Same 10 04** *76*).	
GS ENQ	**1D 05**	Real time printer status transmission.	**133**

11.11 Bar Code Commands

These commands format and print bar codes and are described in order of their hexadecimal codes.

Code ASCII	Code Hexadecimal	Description	Page
GS H n	**1D 48** *n*	Select printing Position of HRI Characters.	**149**
GS f n	**1D 66** *n*	Select Pitch of HRI Characters.	**162**
GS h n	**1D 68** *n*	Select Bar Code Height.	**162**
GS k m d1 … dk NUL	**1D 6B** *m dl…*	Print Bar Code first variation.	**163**
GS k m n d1 … dk	**1D 6B** *m n d1 … dk*	Print Bar Code second variation.	**163**
GS m nthick nthin	**1D 6D** *m nthick …*	Set bar Code Aspect Ratio (ITF and Code 39 only).	**166**
GS w n	**1D 77** *n*	Select Bar Code Width	**170**

11.12 Page Mode Commands

Page mode is one of two modes that the printer controller uses to operate. Standard mode is typical of how most printers operate by printing data as it is received and feeding paper as the various paper feed commands are received. Page mode is different in that it processes or prepares the data as a “page” in memory before it prints it. Think of this as a virtual page. The page can be any area within certain parameters that you define. The page printed using either the FF (0C) or the ESC FF (1B 0C) command.

The select page mode command (1B 4C) puts the printer into page mode.Any commands that are received are interpreted as page mode commands. Several commands react differently when in standard and page mode. The description of these individual commands is indicating below.

Code ASCII	Code Hexadecimal	Description	Page
FF	**0C**	Print and Return to Standard Mode.	**89**
18	**CAN**	Cancel Print Data in Page Mode.	**101**
ESC FF	**1B 0C**	Print Data in Page Mode.	**102**
ESC L	**1B 4C**	Select Page Mode.	**118**
ESC S	**1B 53**	Select Standard Mode.	**120**
ESC T n	**1B 54** *n*	Select Print Direction in Page Mode.	**120**
ESC W xL xH dxL dxH dyL dyH	**1B 57** *xL xH dxL …*	Set Print Area in Page Mode.	**122**
GS $ nL nH	**1D 24** *nL nH*	Set Absolute Vertical Print Position in Page Mode.	**144**
GS \ nL nH	**1D 5C** *nL nH*	Set relative Vertical Position in Page Mode.	**158**

11.13 Macro Commands

These commands are used to select and perform a user-defined sequence of printer operations.

Code ASCII	Code Hexadecimal	Description	Page
GS :	**1D 3A**	Select or Cancel Macro Definition.	**147**
GS ^ r t m	**1D 5E** *r t m*	Execute Macro.	**159**

11.14 Flash Firmware Download Commands

There are three ways to enter the download mode (maintenance mode).

1. Powering the printer up and press and hold paper Feed button. Or Press and hold paper Feed button and press and then released reset Button (Two variation see command 1F 03 DA n).
2. While the printer is running normally, send the command, “Switch to Boot Mode (1B 5B 7D)” to leave normal operation and enter the download mode.
3. If the Flash if found corrupted during Level 0 diagnostics the download mode is automatically entered after the printer has reset.

The printer never goes directly from the download mode to normal printer operation. To return to normal printer operation either the operator must turn the power off and then on to reboot or the application must send a command to cancel download mode and reboot. **Condition Paper Feed Button must in natural position during reboot to return to normal printer operation.**

When each flash download command is received, the printer returns either ACK or NAK to the host computer when each command is received:
ACK (hexadecimal 06): Sent when the printer has received a host transmission and has completed the request successfully. NAK (hexadecimal 15): Sent when a request is unsuccessful.

The commands are listed in numerical order according to their hexadecimal codes. Each command is described and the hexadecimal, decimal, and ASCII codes are listed.
Communicates to the printer the information downloaded from applications. Data is downloaded to flash memory to query the state of the firmware, calculate the firmware CRC and other functions.

These commands are used to load firmware into the printer:

Code ASCII	Code Hexadecimal	Description	Page
ESC [}	**1B 5B 7D**	Switch to Boot Loader (Maintenance Mode).	**123**
GS SOH	**1D 01**	Return Flash Memory Size.	**131**
GS STX nn	**1D 02** *nn*	Select Flash Memory Sector to Download.	**131**
GS ACK	**1D 06**	Get Flash Firmware CRC Status.	**133**
GS BEL	**1D 07**	Return Boot Sector CRC.	**134**

GS SO	**1D 0E**	Erase All Flash Contents Except Boot Sector.	**137**
GS SI	**1D 0F**	Return Main Program Flash CRC.	**137**
GS DLE n	**1D 10** *n*	Erase Selected Flash Sector.	**138**
GS DC1 al ah cl ch d1…dn	**1D 11** *al ah cl ch …*	Download to Active Flash Sector.	**138**
GS ²	**1D FD**	Return Eeprom type.	**171**
GS ■	**1D FE**	Return Flash Memory Device ID.	**172**
US SOH d1... dn	**1F 01** *d1... dn*	Erase Boot Sector + download new boot code.	**172**
US BS n	**1F 08** *n*	Set New Boot “Loader” Code Size.	**205**
US HT n	**1F 09** *d1... dn*	Same Command 1F 01 … with reply Status.	**206**
US LF l = n m	**1F 0A 6C 3D** *n m*	Read Layer Information.	**212**
US FF S A F n	**1F 0C 53 41 46** *n*	Reset/Set Boot Compatibility Check Before Download.	**221**

11.14.1 Main program Firmware Download Sequence (*.bin file)

By providing a set of low level commands, great freedom of implementation is given to customer application to customize the sequence to match its specific requirements.

Following is the description of a typical main program Firmware download sequence.
Only the main steps are mentioned. Error checking and error recovery is not described:

1) Switch to Boot Mode (maintenance mode).

2) Check Flash Memory Size.

3) Erase all Flash Memory sectors, except Boot Sector.

4) Download Code to Active Flash Sector.

   4.1) Select Flash memory sector #n (each sector contains 64kbytes).
   - 4.1.1) Program segment of n bytes
   - 4.1.2) if more segments, loop back to 4.1.1)

   4.2) if more sectors to program, loop back to 4.1)

5) Check Flash CRC

6) Reboot Printer

11.14.2 Boot program Firmware Download (*.pbt file)

1) Transmit pbt file to the printer, no control sequence.

2) Printer Switch to Boot Mode (maintenance mode).

3) Printer Check the new firmware (CRC, Identify…).

4) If Ok. Printer Program the new Boot (pbt file).

5) Reboot Printer.

Nota: Command switch to maintenance mode (1B 5B 7D) is present into the pbt file.

11.15 Manage User Flash or SRAM -Memory Commands

Code ASCII	Code Hexadecimal	Description	Page
GS " n	**1D 22** *n*	Set Memory Type (RAM/FLASH) for saving logo/user-font.	**140**
GS " U n1n2	**1D 22 55** *n1 n2*	Flash Memory User Sector allocation.	**141**
GS " d n	**1D 22 64** *n*	Lock Specific 64K user sector	**142**
GS " e	**1D 22 65**	Reply Status flag Lock specific 64K	**143**
GS @ n	**1D 40** *n*	Erase Sections of User Flash sector.	**148**
US w NUL	**1F 77** *00*	Reply high block bytes size *SRam Memory Allocation*.	**238**
US w	**1F 77** *01*	Reply the amount of flash memory *Logo/Font* section.	
US w	**1F 77** *02*	Reply the amount of flash memory *Easy Font* section.	
US w	**1F 77** *03*	Reply the amount of flash memory *User* section.	

For more information, see chapter « SRAM MEMORY ALLOCATION »

11.16 User Data Storage Commands

Code ASCII	Code Hexadecimal	Description	Page
ESC 'm a2 a1 a0 d1 … dn	**1B 27** *m a2 a1 a0 …*	Write to User-defined Character Set.	**107**
ESC 4 m a2 a1 a0	**1B 34** *a2 a1 a0*	Read from User Data Storage	**111**

11.17 Multi-Heat Mode Commands

NB in multi-heat mode the aim is to limit the pic current and to divise the heat in several, be careful the speed decrease following the number of multi-heat selected and also following the number of dot ON printed!

Code ASCII	Code Hexadecimal	Description	Page
GS % n dH dL	**1D 25** *n dH dL*	Select or cancel Multi-Heat Mode.	**145**
US ETX Ñ s dL dH	**1F 03 A5** *s dL dH*	Set Multi-Heat Mode in NVM.	**196**
US BEL Ñ	**1F 07** *A5*	Read Configuration Multi-Heat Mode (NVM).	**204**

11.18 Peripheral Control Commands

Code ASCII	Code Hexadecimal	Description	Page
ESC = n	**1B 3D** *n*	Select Peripheral Device (For Multi-Drop).	**112**
ESC c 5 n	**1B 63 35** *n*	Enable or Disable Panel Switch.	**125**

11.19 Position count Commands

Code ASCII	Code Hexadecimal	Description	Page
DLE ACK	**10 06**	Real time current position count transmission (USM).	**95**
ESC +	**1B 2B**	Increment current position count (USM).	**108**
ESC z	**1B 7A**	Clear current position count (USM).	**127**
GS a n	**1D 61** *n*	Select or cancel unsolicited status Mode (USM)	**160**

11.20 Transaction Monitoring Commands

The following commands are provided as tools to monitor actual transaction completion, by providing synchronisation mechanisms with cut commands or other (see also USM).

Code ASCII	Code Hexadecimal	Description	Page
US a n	**1F 61** *n*	Process Ticket Counter.	**231**
US b	**1F 62**	Request Ticket Counter.	**231**
	1F 63 n	Set Cut Tag	**232**
	1F 64	Request Cut Tag	**232**

11.21 Paper Cut Commands

Code ASCII	Code Hexadecimal	Description	Page
EM	**19**	Perform Full Knife Cut	**101**
SUB	**1A**	Perform partial Knife Cut	**101**
ESC i	**1B 69**	Perform Full Knife Cut	**101**
ESC m	**1B 6D**	Perform partial Knife Cut	**101**
GS V m	**1D 56 m**	Select Cut Mode and Cut Paper	**155**
GS V m n	**1D 56 m n**	Select Cut Mode and Cut Paper	**155**
GS V m n l	**1D 56 m n l**	Select Cut Mode and Cut Paper	**155**

11.22 Printer Configurations Commands

The following commands are designed to read or modify the controller configuration (store the new settings in EEPROM = NVM).

Those commands are typically used in factory environment, when assembling the controller board with the mechanism.
Note that the new settings become active after the printer is rebooted.

Presentation Menu : **** Diagnostic For m****

11.22.1 Reference Number Commands

- **Write Configuration:**

Code ASCII	Code Hexadecimal	Description	Page
GS I @ SP	**1D 49 40** *20*	Write to NVM *Serial number*.	**151**
GS I @ !	**1D 49 40** *21*	Write to NVM *Serial number* and print.	
GS I @ #	**1D 49 40** *24*	Write to NVM *Class/model*.	
GS I @ $	**1D 49 40** *25*	Write to NVM *Class/model* and print.	
GS u d0 … d9	**1D 75** *d0 … d9*	Store User *Revision Number* in NVM.	**169**

- **Read Configuration:**

Code ASCII	Code Hexadecimal	Description	Page
GS I @ #	**1D 49 40** *23*	Return *Serial Number*.	**151**
GS I @ ‘	**1D 49 40** *27*	Return *Class/model #*.	
GS I n	**1D 49** *44*	Transmit *Printer Serial Number*.	
GS x	**1D 78**	Transmit User *Revision Number*.	**171**

11.22.2 Firmware (ID_Rev_CRC) Commands

- **Read Configuration:**

Code ASCII	Code Hexadecimal	Description	Page
GS I @ /	**1D 49 40** *2F*	Return *Boot firmware CRC*.	**151**
GS I @ 7	**1D 49 40** *37*	Return *Client firmware CRC*.	
GS I @ ù	**1D 49 40** *97*	Return *Boot firmware version*.	
GS I @ ú	**1D 49 40** *A3*	Return *Flash firmware version*.	
US LF I = n m	**1F 0A 6C 3D** *n m*	Read Layer Information.	**212**

11.22.3 Hardware Commands

- **Write Configuration:**

Code ASCII	Code Hexadecimal	Description	Page
US ETX EOT m	**1F 03 04** *m*	Set *Maximum Power* Consumption in NVM.	**176**
US ETX œ m	**1F 03 91** *m*	Set Low Voltage Detection Mode	**189**
US LF w = m	**1F 0A 77 3D** *m*	Select or Cancel Watchdog Mode in NVM.	**214**

- **Read Configuration:**

Code ASCII	Code Hexadecimal	Description	Page
GS BS	**1D 08**	Return Static RAM Size.	**134**
GS HT	**1D 09**	Return CPU frequency (in MHz).	**134**
GS VT	**1D 0B**	Return User Flash Size.	**136**
US BEL EOT	**1F 07** *04*	Read Configuration Setting *Max Power.*	**204**
US BEL w	**1F 07** *77*	Read configuration Watchdog Status.	
US BEL œ	**1F 07** *91*	Read Low Voltage Detection Mode	

11.22.4 User Flash Storage Commands

- **Write Configuration:**

Code ASCII	Code Hexadecimal	Description	Page
GS " U n1n2	**1D 22 55** *n1 n2*	Flash Memory User Sector allocation.	**141**
GS " d n	**1D 22 64** *n*	Lock Specific 64K user sector	**142**
GS @ n	**1D 40** *n*	Erase User Flash Sector.	**148**

- **Read Configuration:**

Code ASCII	Code Hexadecimal	Description	Page
GS " e	**1D 22 65**	Reply status flag "lock specific 64k user sector" status.	**143**
US w n	**1F 77** *n*	Return User flash memory sectors allocation status.	**238**

11.22.5 Mechanism parameters

- **Write Configuration:**

Code ASCII	Code Hexadecimal	Description	Page
US ETX BS n	**1F 03 08** *n*	Set Paper width in NVM.	**176**
US ETX ï n	**1F 03 8B** *n*	Set Mechanism Type in NVM.	**186**
US ETX Å n	**1F 03 8F** *n*	Set Paper Type in NVM.	**188**
US VT N R J n	**1F 0B 4E 52 4A** *n*	Set Print density in NVM.	**219**
US FF S P F nL nH	**1F 0C 53 50 46** *…*	Set Printer Maximum Speed in NVM.	**220**

- **Read Configuration:**

Code ASCII	Code Hexadecimal	Description	Page
US BEL BS	**1F 07** *08*	Read Paper width.	**204**
US BEL ï	**1F 07** *8B*	Read Mechanism Type.	
US BEL Å	**1F 07** *8F*	Read Paper Type.	
US BEL E	**1F 07** *46*	Read Configuration *Print Speed.*	
US BEL J	**1F 07** *4A*	Read Configuration *Print density Coefficient.*	

11.22.5.1 Multi-Heat Mode Commands

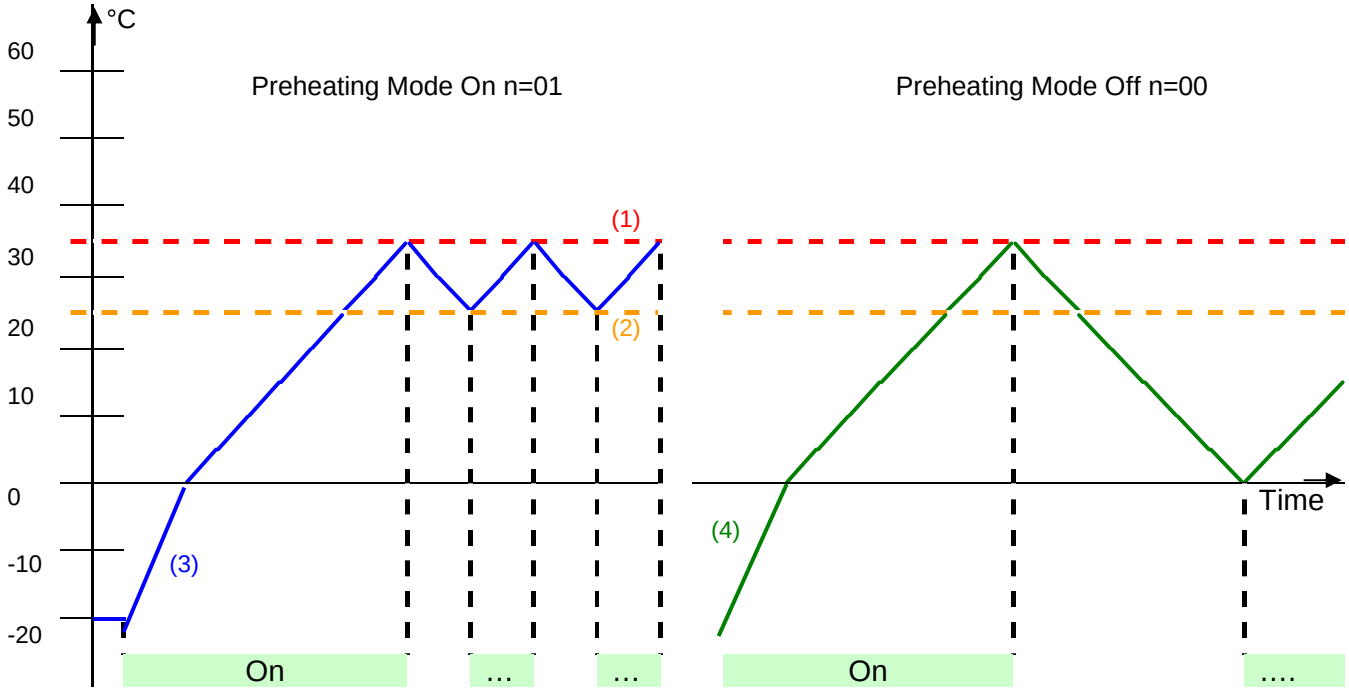
- **Write Configuration:**

Code ASCII	Code Hexadecimal	Description	Page
GS % n dH dL	**1D 25** *n dH dL*	Select or cancel Multi-Heat Current Mode.	**145**
US ETX Ñ s dL dH	**1F 03 A5** *s dL dH*	Set Multi-Heat Mode in NVM.	**196**

- **Read Configuration:**

Code ASCII	Code Hexadecimal	Description	Page
US BEL Ñ	**1F 07 A5**	Read Configuration Multi-Heat Mode in NVM.	**204**

11.22.5.2 Pre-Heat Commands



(1) Limit hight to stop preheating = Under 36°C.
(2) Limit Low to Start preheating = Below 25°C.
(3) T°C see on thermal head with preheating Mode On.
(4) T°C see on thermal head with preheating Mode Off. = Automatic start below -1°C to -20°c

- **Write Configuration:**

Code ASCII	Code Hexadecimal	Description	Page
US ETX VT n	**1F 03 0B n**	Set PreHeating Mode option	**178**

- **Read Configuration:**

Code ASCII	Code Hexadecimal	Description	Page
US BEL VT	**1F 07 0B**	Read PreHeating Mode status option	**204**

11.22.5.3 Knife Commands

- **Write Configuration:**

Code ASCII	Code Hexadecimal	Description	Page
US ETX SOH n	**1F 03 02 n**	Set Knife Option (NVM)	**175**
US ETX LF n	**1F 03 0A n**	Select partial cut Distance (NVM)	**177**
US ETX é n	**1F 03 82 n**	Set Minimum Receipt Length (NVM)	**184**
US SO SOH nL nH	**1F 0E 01 nL nH**	Set partial cut Distance (NVM)	**223**

- **Read Configuration:**

Code ASCII	Code Hexadecimal	Description	Page
US BEL STX	**1F 07 02**	Read Knife Option.	**204**
US BEL LF	**1F 07 0A**	Read current Partial Cut Distance.	
US BEL é	**1F 07 82**	Read Minimum Receipt Length.	

11.22.5.4 Paper insertion Commands

- **Write Configuration:**

Code ASCII	Code Hexadecimal	Description	Page
US ETX ó	**1F 03 A2 n**	Set Paper Introduction Type (bottom, Top).	**195**
US ETX ª	**1F 03 A6 n**	Set Paper Autoload Mode.	**197**
US ETX Ð	**1F 03 D1 nL nH**	Set Autoload Time Delay.	**198**
US LF Ø	**1F 0A 9D nL nH**	Set Autoload Step Number.	**217**

- **Read Configuration:**

Code ASCII	Code Hexadecimal	Description	Page
US BEL ó	**1F 07 A2**	Read Paper Introduction Type.	**204**
US BEL ª	**1F 07 A6**	Read Paper Autoload Mode.	
US BEL Ð	**1F 07 D1**	Read Autoload Time delay.	
US LF ×	**1F 0A 9E**	Read Autoload Step Number.	**218**

11.22.5.5 Motor Current Commands

- **Write Configuration:**

Code ASCII	Code Hexadecimal	Description	Page
US LF ENQ C n m	**1F 0A 05 43** *n m*	Write PWM Current Value for Knife Motor.	**208**
US LF ENQ P n m	**1F 0A 05 50** *n m*	Write PWM Current Value for Paper Feed Motor.	**208**

US LF ù l m	**1F 0A 97** *l m*	Save Current (mA) Knife Motor in NVM.	**215**
US LF Ü l m	**1F 0A 9A** *l m*	Save Current (mA) Paper Feed Motor in NVM.	**216**
US LF ▒ n	**1F 0A B0** *n*	Set Hold Paper feed Motor Mode in NVM.	218

- **Read Configuration:**

Code ASCII	Code Hexadecimal	Description	Page
US LF 05 C NUL NUL	**1F 0A 05 43** *00 00*	Read PWM Current Value For Knife Motor.	**207**
US LF 05 P NUL NUL	**1F 0A 05 50** *00 00*	Read PWM Current Value For Paper Feed Motor.	**207**
US LF ÿ	**1F 0A 98**	Read Current (mA) Knife Motor.	**216**
US LF ø	**1F 0A 9B**	Read Current (mA) Paper Feed Motor.	**217**
US BEL ▒	**1F 07** *B0*	Read Hold Paper Feed Motor Mode.	**204**

11.22.5.6 Detection Sensor Commands

- **Write Configuration:**

Code ASCII	Code Hexadecimal	Description	Page
GS s m n	**1D 73** *m n*	Store Selected Sensor Threshold in NVM.	**167**
US ETX └n	**1F 03 03** *n*	Set Paper Low Sensor Mode in NVM.	**175**
US ETX DC3 n0 …n4	**1F 03 13** *n0 … n4*	Set sensors assignation in NVM.	**180**
US ETX ç n	**1F 03 87** *n*	Set Top Of Form Mode in NVM.	**185**
US ETX ê n	**1F 03 88** *n*	Set Paper Jam Mode in NVM.	**186**
US ETX ë m	**1F 03 89** *m*	Set Cover sensor option in NVM.	**186**
US ETX « n	**1F 03 AE** *n*	Set Paper Low time Out Option in NVM.	**197**
US LF ENQ T n m	**1F 0A 05 54** *n m*	Write PWM Current Value for Top Of Form Sensor.	**208**
US LF c=p;r=n;p=m	**1F 0A 63 3D 50 …**	Set PWM Top Of Form in NVM.	**212**

- **Read Configuration:**

Code ASCII	Code Hexadecimal	Description	Page
US BEL s n	**1F 07 73** *n*	Read Configuration *Sensor threshold.*	**204**
US BEL	**1F 07 03**	Read Paper Low Sensor Mode	
US BEL	**1F 07 13**	Read Sensors assignation	
US BEL	**1F 07 87**	Read Top Of Form Mode	
US BEL	**1F 07 88**	Read Paper Jam Mode	
US BEL ë	**1F 07 89**	Read Configuration Setting *Set Cover Sensor Option.*	
US BEL	**1F 07 AE**	Read Configuration Setting *Paper Low Time out.*	

US LF 05 T NUL NUL	**1F 0A 05 54** *00 00*	Read PWM Current Value for Top Of Form Sensor.	**207**

11.22.6 Communication interface Commands

- **Write Configuration:**

Code ASCII	Code Hexadecimal	Description	Page
GS a n	**1D 61** *n*	Select or Cancel Unsolicited Status Mode (USM).	**160**
US STX n1 n2 n3 n4 n5 n6	**1F 02** *n1 … n5 n6*	Set Communication Parameters in NVM.	**173**
US ETX É m	**1F 03 90** *m*	Set Fault Recovery Mode in NVM.	**188**
US ETX Ø m	**1F 03 9D** *m*	Set option to enable count trigger in USM in NVM.	**193**
US ETX Ë m	**1F 03 D3** *m*	Set Driver USB Easy Mode in NVM.	**199**
US LF R = n	**1F 0A 52 3D** *n*	Set Rx Buffer Size in NVM.	**210**

- **Read Configuration:**

Code ASCII	Code Hexadecimal	Description	Page
US BEL DLE	**1F 07** *10*	Read Configuration read *Communication* Parameters.	**204**
US BEL É	**1F 07** *90*	Read Configuration Setting *Fault Recovery.*	
US BEL Ø	**1F 07** *9D*	Read Configuration Setting *count triggers USM Mode.*	
US BEL Ë	**1F 07** *D3*	Read Configuration Driver USB Easy Mode.	

11.22.7 Print Options Commands

- **Write Configuration:**

Code ASCII	Code Hexadecimal	Description	Page
US ETX NUL n	**1F 03 00** *n*	Set Diagnostic Mode in non-volatile memory.	**174**
US ETX ô m	**1F 03 93** *m*	Set Carriage Return Usage in non-volatile memory.	**189**
US ETX ö m	**1F 03 94** *m*	Set Lines Per Inch Default Setting in NVM.	**190**

- **Read Configuration:**

Code ASCII	Code Hexadecimal	Description	Page
US BEL NUL	**1F 07** *00*	Read Configuration Setting *Diagnostic Mode value*.	**204**
US BEL ô	**1F 07** *93*	Read Configuration Setting *Carriage Return Usage.*	
US BEL ö	**1F 07** *94*	Read Configuration Setting *Default LPI.*	

11.22.8 Fonts Commands

- **Write Configuration:**

Code ASCII	Code Hexadecimal	Description	Page
US ETX VT m	**1F 03 0F** *m*	Set Default Font in non-volatile memory.	**179**

- **Read Configuration:**

Code ASCII	Code Hexadecimal	Description	Page
US BEL VT	**1F 07 0F**	Read Default Font configuration.	**204**

11.22.9 Code Pages Commands

- **Write Configuration:**

Code ASCII	Code Hexadecimal	Description	Page
US ETX Ç m	**1F 03 80** *m*	Set Default Font in non-volatile memory.	**179**

- **Read Configuration:**

Code ASCII	Code Hexadecimal	Description	Page
US BEL Ç	**1F 07 80**	Read Default Code Page configuration.	**204**

11.22.10 User Tallies Commands

- **Write Configuration:**

Code ASCII	Code Hexadecimal	Description	Page
GS I @ Ç	**1D 49 40** *80*	Write to NVM *Receipt lines* tally.	**151**
GS I @ ü	**1D 49 40** *81*	Write to NVM *Receipt lines* tally and print.	
GS I @ é	**1D 49 40** *82*	Clear to NVM *Receipt lines* tally to 0.	
GS I @ â	**1D 49 40** *83*	Write to NVM *Knife Cut* tally.	
GS I @ ä	**1D 49 40** *84*	Write to NVM *Knife Cut* tally and print.	
GS I @ à	**1D 49 40** *85*	Clear to NVM *Knife Cut* tally to 0.	
GS I @ É	**1D 49 40** *90*	Write to NVM *Hours on* tally.	
GS I @ æ	**1D 49 40** *91*	Write to NVM *Hours on* tally and print.	
GS I @ Æ	**1D 49 40** *92*	Clear to NVM *Hours on* tally.	
GS I @ ñ	**1D 49 40** *A4*	Write to NVM *Flash cycles* tally.	
GS I @ Ñ	**1D 49 40** *A5*	Write to NVM *Flash cycles* tally and print.	
GS I @ ª	**1D 49 40** *A6*	Clear to NVM *Flash cycles* tally.	
GS I @ ¿	**1D 49 40** *A8*	Write to NVM *Knife Jams* tally.	
GS I @ ®	**1D 49 40** *A9*	Write to NVM *Knife Jams* tally and print.	
GS I @ ¬	**1D 49 40** *AA*	Clear to NVM *Knife Jams* tally.	
GS I @ ¼	**1D 49 40** *AC*	Write to NVM *Cover openings* tally	
GS I @ ¡	**1D 49 40** *AD*	Write to NVM *Cover openings* tally and print.	
GS I @ «	**1D 49 40** *AE*	Clear to NVM *Cover openings* tally.	
GS I @ ▒	**1D 49 40** *B2*	Set maximum temperature tally to -273 (clear tally).	
GS I @ ┤	**1D 49 40** *B4*	Write to NVM *Reboot device* tally.	
GS I @ Á	**1D 49 40** *B5*	Write to NVM *Reboot device* tally and Print.	
GS I @ Â	**1D 49 40** *B6*	Clear to NVM *Reboot device* tally.	
GS I @ Ï	**1D 49 40** *D8*	Write to NVM *Meter print* tally.	
GS I @ ┘	**1D 49 40** *D9*	Write to NVM *Meter print* tally and Print.	
GS I @ ┌	**1D 49 40** *DA*	Clear to NVM *Meter print* tally.	

- **Read Configuration:**

Code ASCII	Code Hexadecimal	Description	Page
GS I @ â	**1D 49 40** *83*	Return *Receipt lines* tally in NVM.	**151**
GS I @ ç	**1D 49 40** 87	Return *Knife Cut* tally in NVM.	
GS I @ ô	**1D 49 40** *93*	Return *Hours on* tally in NVM.	
GS I @ °	**1D 49 40** *A7*	Return *Flash cycles* tally in NVM.	
GS I @ ½	**1D 49 40** *AB*	Return *Knife Jams* tally in NVM	
GS I @ »	**1D 49 40** *AF*	Return *Cover openings* tally in NVM.	
GS I @ │	**1D 49 40** *B3*	Return *Temperature* tally in NVM.	
GS I @ À	**1D 49 40** *B7*	Return *Reboot device* tally in NVM.	
GS I @ ■	**1D 49 40** *DB*	Return *Meter print* tally in NVM.	

11.22.11 Others Commands

- **Execute Commands:**

Code ASCII	Code Hexadecimal	Description	Page
US LF t = n	**1F 0A 74 3D** *n*	Read Com Port specific Informations (Read: Diagnostic Form, Heating time, Current ticket speed).	**213**
US LF è	**1F 0A 8A**	Print Heating Time Table.	**215**
US CR D U M	**1F 0D 44 55 4D**	Dump NVM Memory Parameters.	**222**
US t	**1F 74**	Print Diagnostics Form.	**234**

- **Write Configuration:**

Code ASCII	Code Hexadecimal	Description	Page
US ETX ┌ n	**1F 03 DA** *n*	Set Reset Sequence “to go Maintenance Mode” or “to Print Self test”	**201**
US ETX ▐ n	**1F 03 DB** *n*	Select Ticket Form for Start-up diagnostics	**202**
US LF DLE n	**1F 0A 10** *n*	Set Power Supply Coefficient.	**208**

- **Read Configuration:**

Code ASCII	Code Hexadecimal	Description	Page
US BEL →	**1F 07 1A**	Return Power Supply Coefficient.	**204**
US BEL ┌	**1F 07 DA**	Reply Reset Sequence Option.	
US BEL ▐	**1F 07 DB**	Reply Ticket form Option.	

11.23 Top Of Form Command

Configuration

TOF detection requires an additional sensor mounted on the paper path and facing the pre-printed TOF marks.

A few key parameters need to be set :

- TOF Mark To Mark Distance: Distance between two consecutive marks. This distance should match the paper specification
- TOF Mark To Cut Distance : Desired distance between TOF mark and knife edge after automatic positioning
- TOF Paper Path : either clamshell or straight path, according to how the paper is loaded and where the TOF sensor is mounted.

Calibration

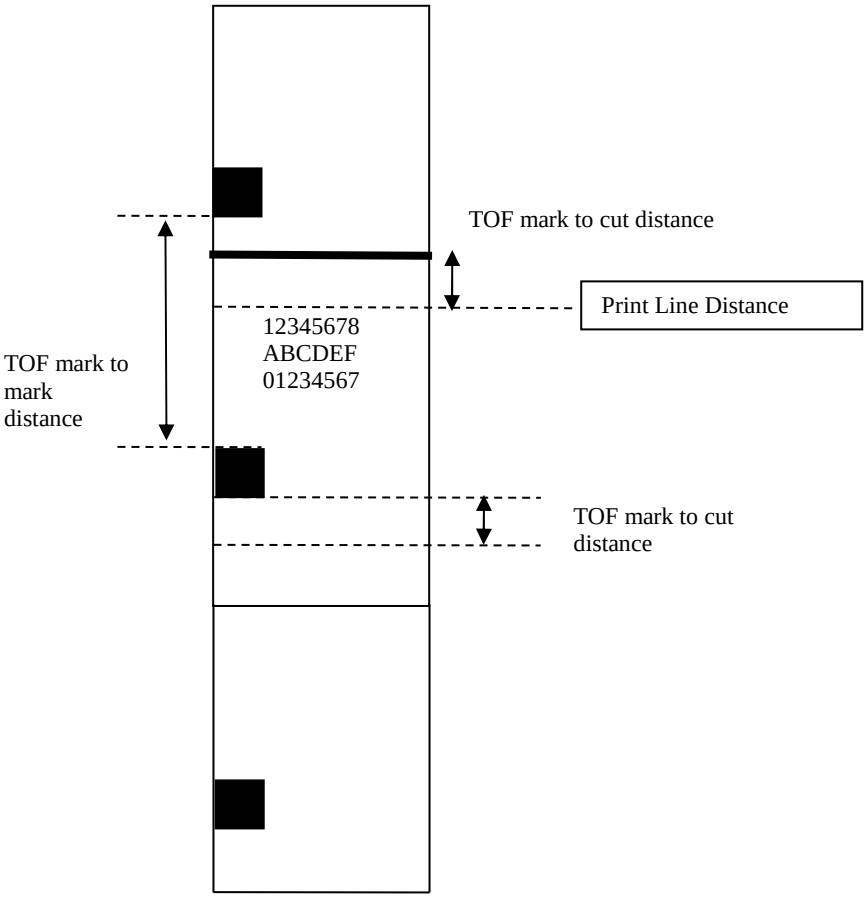
There is no automatic calibration of the sensor.

However the TOF detection threshold may be adjusted through a configuration command if required, for example if the black marks optical density is too low.

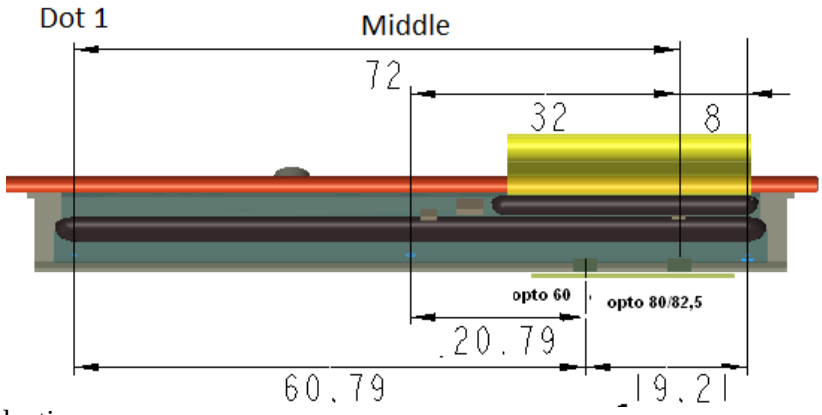
Positioning

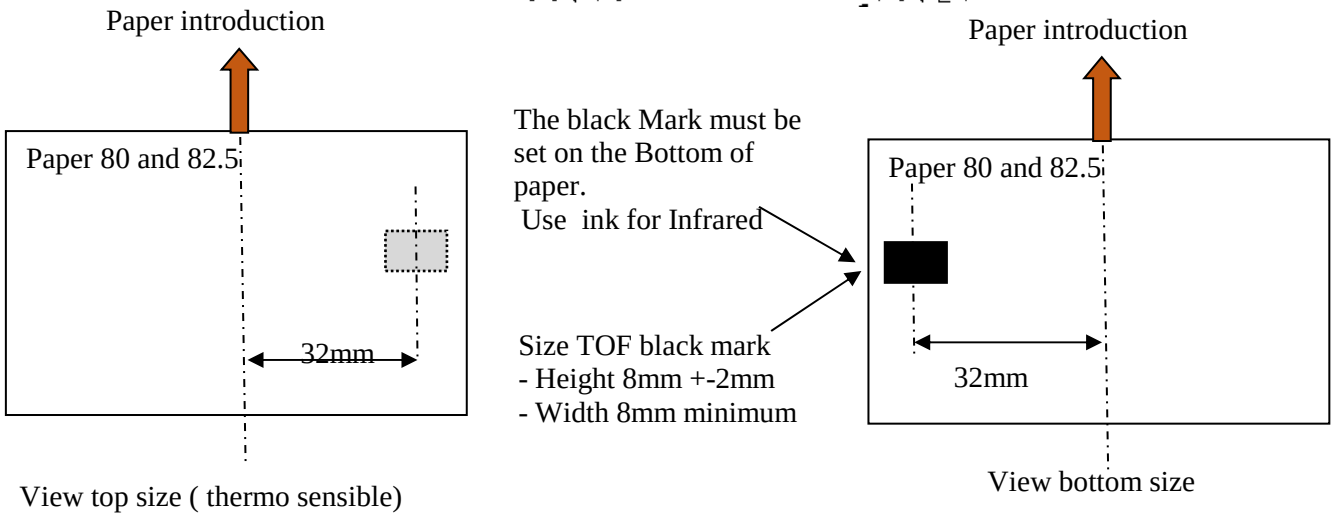
The paper is positioned automatically at the selected distance from the black mark in 3 cases :

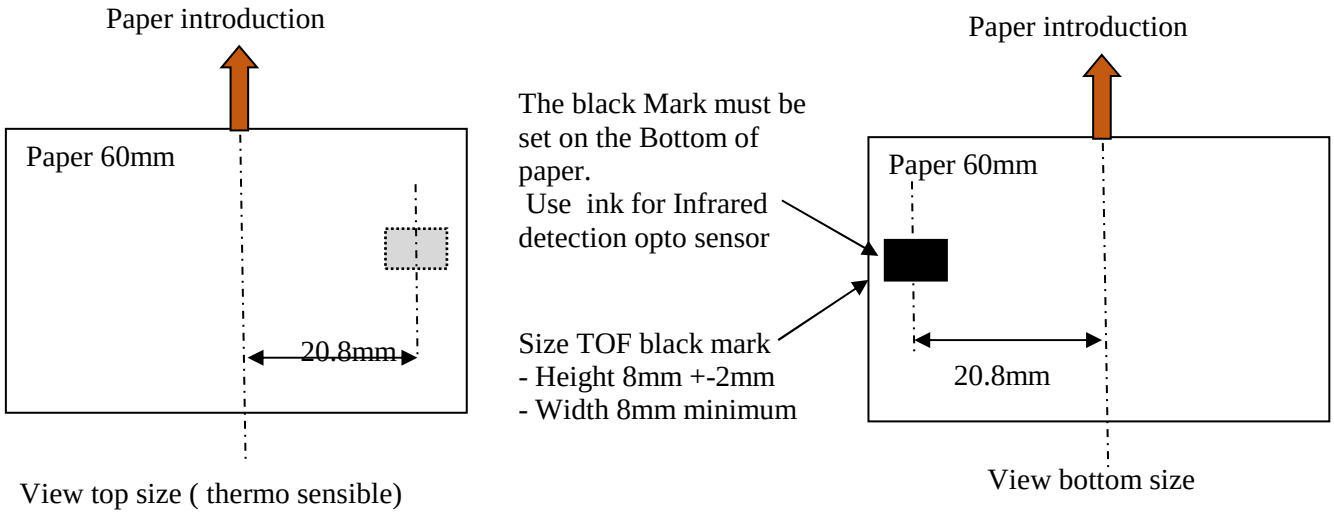
- after issueing the “Feed to TOF” command
- when using the paper feed button
- when closing the printer cover


TOF mark to cut distance
Print Line Distance
12345678
ABCDEF
01234567
TOF mark to
mark
distance
TOF mark to cut
distance

11.1 TOF drawing and position







NB the minimum distance between two black mark is 65mm !

- **Execute Command:**

Code ASCII	Code Hexadecimal	Description	Page
SO	**0E**	Feed to Top of form	**90**
GS t	**1D 74**	TOF threshold Sensor Auto calibration.	**168**
-	-	PWM TOF Auto calibration Mode.	-

- **Write Configuration Command:**

Code ASCII	Code Hexadecimal	Description	Page
GS s m n	**1D 73** *m n*	Store Selected Sensor Threshold in NVM.	**167**
US ETX NAK n	**1F 03 15** *n*	Set TOF Paper Path Option.	**181**
US ETX ç n	**1F 03 87** *n*	Set Top Of Form Mode.	**185**
US ETX Ä n	**1F 03 8E** *n*	Set Offset start TOF mark	187
US ETX ù nL nH	**1F 03 97** *nL nH*	Set additional distance search to find one TOF.	**190**
US ETX ÿ nL nH	**1F 03 98** *nL nH*	Set TOF Mark to Mark Distance.	**192**
US ETX Ö nL nH	**1F 03 99** *nL nH*	Set TOF Mark to Cut Distance.	**192**
US ETX Á n	**1F 03 B5** *nL nH*	Set TOF Search Mark After Close Option.	-
US ETX Ê n	**1F 03 D2** *nL nH*	Set Sensor to Cut Distance.	**199**
US ETX Î n	**1F 03 D7** *nL nH*	Set Offset Cut Distance Value.	**200**
US ETX DC3 n0 …n4	**1F 03 13** *n0 … n4*	Set sensors assignation in NVM.	**180**
US LF ENQ T n m	**1F 0A 05 54** *n m*	Write PWM Current Value for Top Of Form Sensor.	**98**

- **Read Configuration Command:**

Code ASCII	Code Hexadecimal	Description	Page
US BEL NAK	**1F 07 15**	Read TOF paper path Option.	**204**
US BEL	**1F 07 13**	Read Sensors assignation	
US BEL ç	**1F 07 87**	Read Top Of Form Option.	
US BEL ÿ	**1F 07 98**	Read TOF Mark to Mark Distance.	
US BEL Ö	**1F 07 99**	Read Knife To TOF Mark Distance.	
US BEL Á	**1F 07 B5**	Read TOF Search Mark After Close Option.	
US BEL Ê	**1F 07 D2**	Read Sensor to Cut Distance.	
US BEL Î	**1F 07 D7**	Read Offset Cut distance value.	
US LF c=p;r=n;p=m	**1F 0A 63 3D 50 …**	Set PWM Top Of Form in NVM.	**212**

11.2 Packet Protocol commands

A packet protocol has been defined to ensure security of the data stream sent to the printer.

Packet Usage

All data transmitted to the printer from the host CPU will be enclosed within a packet. The number of data bytes within a packet is variable, but must be limited to fit within the size of the input buffer.

Data transmitted from the printer to the host CPU is limited to between one and eight status bytes. This data stream will not use the packet protocol nor will it contain a checksum.

Packet Format

The STX character (02h) defines the start of a packet and the ETX character (03h) defines the end of a packet. The checksum byte immediately follows the ETX character. Any data received prior to the STX character will be ignored by the printer and causes the packet frame status bit to be set.

If an STX character is received in the middle of a packet (after an STX and before an ETX is received), all data received prior to the second STX will be purged from the input buffer and the packet frame status bit will be set.

Checksum Calculation

The checksum byte is determined by calculating the two's complement of the sum of all of the data bytes within the packet. The checksum is calculated beginning with the first character immediately following the STX character and ends with the ETX character. Note that the STX character is not included in the checksum calculation, but the ETX character is. The calculated checksum is then added to the received checksum. If the result is zero, then the packet is valid. If the result is non-zero, the packet is corrupt. A corrupt packet is purged from the input buffer without acting on any data within the packet and causes the Checksum Status bit to be set.

Character Substition

The STX (02h), ETX (03h) and SUB (1Ah) control characters will be treated as control characters unless they are the checksum byte. When included as downloaded data (i.e. graphics data or command parameters), character substitution is required. If the printer receives a SUB (1Ah) character, it will perform a one's complement of the next data byte it receives. This complemented byte will be automatically loaded into the input buffer without checking whether it is a control character.

The checksum calculation will include the byte after it has been complemented without the SUB character.

Example: A packet containing a real time printer status request. The non-packeted command string would be DLE EOT *n* where *n* = 02h (which is an STX control character). The packeted string would translate to STX DLE EOT SUB FDh ETX E7h (02h 10h 04h 1Ah FDh 03h E7h). The FDh data byte is the one's complement of 02h. The checksum is the two's complement of 10h + 04h + 02h + 03h = E7h.

Packet definition commands

These commands define the start and end of a packet as well as the counter control.

The counter can be used to determine when an operation is complete. The clear and increment count commands are buffered, so these commands can be used throughout a transaction to determine which operation is being performed by the printer at any given time. If a printer fault occurs, this count will allow the host to determine where in the transaction the fault occurred.

Character Start Of Frame

ASCII	STX
Hexadecimal	**02**
Decimal	2

Character End Of Frame

ASCII	ETX
Hexadecimal	**03**
Decimal	3

Character substitution

ASCII	SUB	*n*
Hexadecimal	**1A**	***n***
Decimal	26	*n*

Operand:	*n*	= character to be substituted
Limit:	**Decimal:**	*n* = 2, *n* = 3, or *n* = 26
	Hex:	*n* = 02, *n* = 03, or *n* = 1A

Description: When the character substitution command is received, the following character will have a one's complement performed on it before it is loaded into the input buffer.

Notes: The STX, ETX, and SUB characters are treated as control characters unless they are the checksum byte.

If the data stream requires an STX, ETX, or SUB character, then a character substitution is required to maintain the integrity of the packet.

The checksum calculation will include the byte after it has been complemented without the SUB character.

- **Write Configuration:**

Code ASCII	Code Hexadecimal	Description	Page
US ETX è n	**1F 03 8A** *n*	Set Packet Protocol Mode	**-**

- **Read Configuration:**

Code ASCII	Code Hexadecimal	Description	Page
US BEL è	**1F 07 8A**	Read Packet Protocol Option	**-**

11.3 Reset Configurations Command

Code ASCII	Code Hexadecimal	Description	Page
US CR C L E n	**1F 0D 43 4C 45 n**	Reset Non-Volatile Memory.	**222**

11.4 External Module

You have a possibility to download in your memory user, one external module firmware.
Only Client (or flash) program support this external module.

The first external Module is a Bar Code 2D "MBC2" with:

- Datamatrix.
- QR codes.

To manage External module the commands are:

Code ASCII	Code Hexadecimal	Description	Page
US LF M D …	**1F 0A 4D 44 …**	Download External Module.	**209**
US LF R M D	**1F 0A 52 4D 44**	Reply information's External Module.	**211**

You can use USB interface or RS232 interface to download "Program Module" file.
The file "Program Module" is configured to downloaded in "User Data storages (= 1)" section. But if you want you can change it.

User Flash Storage sector (Default value)	512Kb Flash Memory	Section Number
Logos/font	64	0
User Data Storages (default)	0	1
EasyFont	128	2

To manage User Flash allocation for download the "Program Module" commands are:

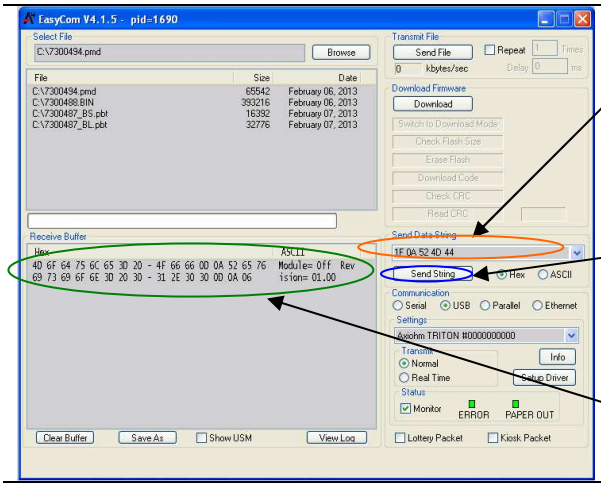
Code ASCII	Code Hexadecimal	Description	Page

GS " U n1n2	**1D 22 55** *n1 n2*	Flash Memory User Sector allocation.	**141**
GS " d n	**1D 22 64** *n*	Lock Specific 64K user sector	**142**
GS @ n	**1D 40** *n*	Erase User Flash Sector.	**148**

1.1.1.How install External Module

For the communication with the printer (Interface RS232, USB, and Ethenet), we using Axiohm software product "EasyCom.exe".

- Check Firmaware compatibility with download external module:

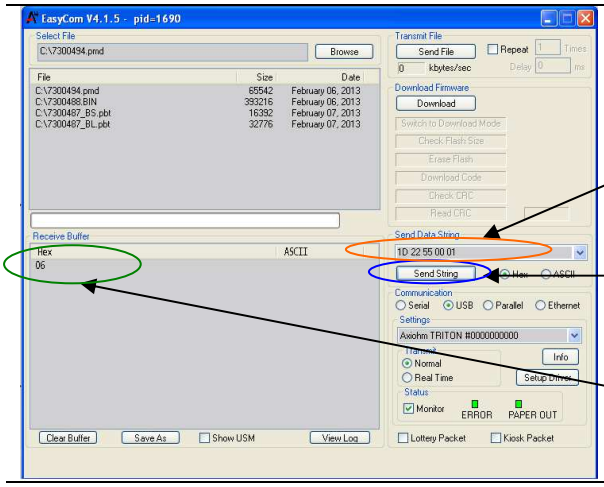


(1) Set hexadecimal command to read information's module.

(2) Send String command.

(3) Reply supported version:
- Off = Module no downloaded.
- 01.00 = Revision module control.

- Set User Data Sector to 64Kbytes:

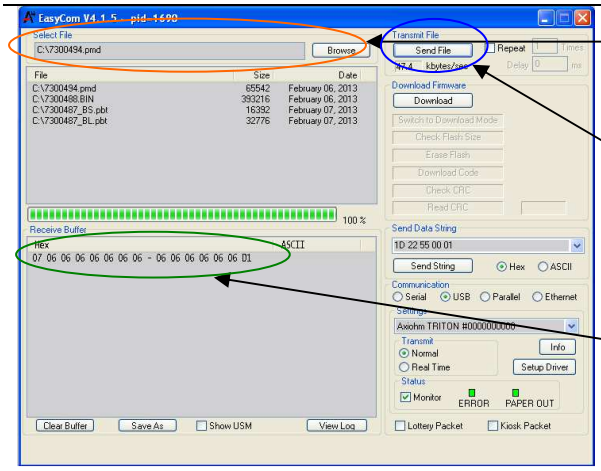


(1) Set Hexadecimal Command User sector allocation.

(2) Send String Command.

(3) Reply information status:
- 06 = ACK = Operation OK.
- 15 = NAK = Error.

- Download Module Bar Code 2D:



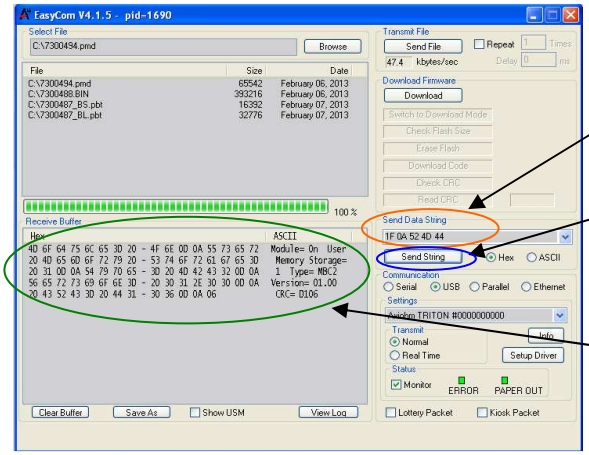
(1) Select module file “7300494.pmd”.

(2) Transmit file selected.

(3) Reply information status:

- 07 = Erase data section (automatic).
- 06 = Acknowledge = Operation Ok.
- 06 D1 = CRC value, 2 bytes, download Ok.
- 15 = No Acknowledge, error download.

- Check information download module:



(1) Set hexadecimal command to read information’s module.

(2) Send String Command.

(3) Reply information status:

- On = External Module present.
- 1 = User Data storages.
- MBC2 = Module name.
- 01.00 = Module version.
- D106 = CRC module.

- See also your ticket “Diagnostics Form”, after send command hexadecimal (1F 74):

…
- Firmware (Id_Rev_Crc) -
…
Extension : 7300494_01.00_D106
…

- if firmware Module “Bar Code 2D” present.

11.4.1 Feature and commands « Bar Code 2D Module»

Product Supported :	Triton 80 : Version 2.00 or superior.
Size Flash Memory bar code module user storage:	64Kbytes
Bar code 2D support : Human Read Information 2D supported:	Datamatrix (ISO/IEC16022) QR Code (ISO/IEC18004). No.
Bar code Print modes :	Standard / Upside Down / Rotated
Maximum characters:	1000 (1)
User Ram Memory Size:	Board triton 80: ~81Kb User features mode

(1) User RAM limitation.

Commands to print and configure “Bar Code 2D Extension” (MBC2):

Code ASCII	Code Hexadecimal	Description	Page
GS k m d1 … dk NUL	**1D 6B** *m dl…*	Print Bar Code first variation.	**163**
GS k m n d1 … dk	**1D 6B** *m n d1 … dk*	Print Bar Code second variation.	**163**
GS w n	**1D 77** *n*	Select Bar Code Width	**170**
FS 2D=DM n0 … n4	**1F 32 44 3D 44 4D…**	Set options for Datamatrix.	**225**
FS 2D=QR n0 … n4	**1F 32 44 3D 51 52 …**	Set options for QR Code.	**227**

12 COMMAND DESCRIPTION

12.1 Command conventions

The following information describes how each command is organized:

Synopsis: Command name designation used to identify the command.

ASCII	the ASCII control code
Hexadecimal	the Hexadecimal control code
Decimal	the Decimal control code
Value or Values	a description of the command operand values
Range , Limit	The upper and lower limits of the command operand
Default	The command operand default after printer reset
Formulas	Any formula used for this command.
Description:	A brief summary of the command, followed by detailed information, if necessary.
Exceptions, Notes:	Describes any exceptions to this command, for example, other commands that the command cannot be used with.
Related Information:	This section describes any related information for this command and provides references to other sections for additional information.

[BP] = Boot Program command (ASCII Title).
[MP] = Main Program command (ASCII Title).
[DBG] = Debug command (ASCII Title).

12.2 List of control commands

HT - [MP]
09
Horizontal TAB

Synopsis:	Horizontal tab.
ASCII	HT
Hexadecimal	**09**
Decimal	9
Description:	Moves the print position to the next tab position set by the Set Horizontal Tab Positions command (1B 44 *n*1 *n*2 ... 00). When no tabs are defined to the right of the current position, or if the next tab is past the right margin, Line Feed is executed. The print position is reset to column one after each line. Print initialization sets 32 tabs at column 9, 17, 25…
Note:	Tab treats the left margin as column one, therefore changes to the left margin will move the tab position.

LF - [MP]
0A
Print and Feed One Line

Synopsis:	Print and feed one line.
ASCII	LF
Hexadecimal	**0A**
Decimal	10
Description:	Prints one line from the buffer and feeds paper one line.

FF - [MP]
0C
Print and Return to Standard mode

Synopsis:	Print and return to standard mode.
ASCII	FF
Hexadecimal	**0C**
Decimal	12
Description:	When printing is completed, values for Select Print Direction in Page Mode (ESC T) and Set Print Area in Page Mode (ESC W) and the position for buffering character data are set. Buffered data is not deleted from the printer. The processed data is printed and the printer returns to standard mode. The developed data is deleted after being printed. For more information see Page Mode in this document.
Note:	This command is enabled only in page mode.

CR - [MP]

0D

Activate Carriage Return

Synopsis:	Carriage return.
ASCII	CR
Hexadecimal	**0D**
Decimal	13
Description:	Prints one line from the buffer and feeds paper one line. The printer can be set through the configuration menu to ignore or use this command. Some applications expect the command to be ignored while others use it as print command.
Note:	See Ignoring/Using the Carriage Return in *Diagnostics* for more information or code (1F 03 93 n).

SO - [MP]

OE

Feed To Top Of Form

Synopsis:	Feed paper to top Of Form.
ASCII	SO
Hexadecimal	**OE**
Decimal	14
Description:	Feeds the paper, so that the next black mark is positioned at selected distance "TOF Mark to Cut" from the cutter edge.
Note :	If the next TOF mark is not detected within the **distance 2 x n**, a TOF fault is declared. It will be necessary to open the cover if exist (create a paper out error) and to load again the paper to clear the fault.

DLE - [MP]
10
Clear Printer

Synopsis:

ASCII	DLE
Hexadecimal	**10**
Decimal	16

Description: Clears the print line buffer without printing and sets the printer to the following condition.

Default: Single Wide, Single-High and Left-Aligned characters.

Number of Columns Width		28 (1)
Character Pitch	(Elite)	12.7 CPI
Extra Dot Rows		0
Character Set	(16*24)	Default
Code Page	(437)	Default
Printing Position		Column One.

DLE EOT n - [MP]

10 04 n

Real Time Status Transmission

Synopsis: Real time status transmission.

ASCII	DLE	EOT	n
Hexadecimal	**10**	**04**	**n**
Decimal	16	4	n

Operand: n = DLE Sequence

Value of n:

Hex:	Dec:	
01	1	Transmit printer status.
02	2	Transmit communication interface busy status.
03	3	Transmit error status.
04	4	Transmit receipt paper status.
76	118	Transmit paper Status In Real Time (Same command reply 1B 76).

Description: Transmits the selected one byte printer status specified by *n* in Real Time according to the following parameters.

Exception: The command is ignored if n is out of range.

Related Information (tables below):

"DLE EOT" **n = 1 = Transmit Printer Status**

Bit	Status	Hex	Decimal	Function
0	Off	00	0	Fixed to Off.
1	On	02	2	Fixed to On.
2	On	00	4	Fixed to On.
3	Off	00	0	Not busy at the communication interface.
	On	08	8	Printer is Busy at the communication interface.
4	On	10	16	Fixed to On.
5	Off	00	0	Received Buffer Empty and Building Buffer Empty.
	On	20	32	Received Buffer No Empty or Building Buffer No Empty.
6	Off	00	0	and Print lines Buffer Empty.
	On	40	64	Print lines Buffer No Empty.
7	Off	00	0	Fixed to Off.

"DLE EOT" **n = 2 = Transmit communication interface Busy Status**

Bit	Status	Hex	Decimal	Function
0	Off	00	0	Fixed to Off.
1	On	02	2	Fixed to On.
2	Off	00	0	Cover is closed.
	On	04	4	Cover is open (if Cover Mode enabled)
3	Off	00	0	Paper feed button is not pressed.
	On	08	8	Paper feed button is pressed.
4	On	10	16	Fixed to On.
5	Off	00	0	Printing not stopped due to paper condition.
	On	20	32	Printing stopped due to paper condition.
6	Off	00	0	No error condition.
	On	40	64	Error condition exists in the printer.
7	Off	00	0	Fixed to Off.

"DLE EOT" **n = 3 = Transmit Error Status**

Bit	Status	Hex	Decimal	Function
0	Off	00	0	Fixed to Off.
1	On	02	2	Fixed to On.
2	Off	00	0	Fixed to Off.
3	Off	00	0	No knife error.
	On	08	8	Knife error occurred.
4	On	10	16	Fixed to On.
5	Off	00	0	No unrecoverable error.
	On	20	32	Unrecoverable error occurred.
6 (1)	Off	00	0	Thermal print head temperature and power supply voltage are in range.
	On	40	64	Thermal print head temperature or power supply voltages are out of range.
7	Off	00	0	Fixed to Off

(1) Recoverable error.

"DLE EOT" **n = 4 = Transmit Receipt Paper Status**

Bit	Status	Hex	Decimal	Function
0	Off	00	0	Fixed to Off
1	On	02	2	Fixed to On
2	Off	00	0	Paper adequate
	On	04	4	Paper Jam (if paper Jam Mode enabled)
3	Off	00	0	Paper adequate
	On	08	8	Paper low (if paper low sensor enabled)
4	On	10	16	Fixed to On
5	Off	00	0	Paper present
	On	20	32	Paper exhausted
6	Off	00	0	Paper present
	On	40	64	Paper exhausted
7	Off	00	0	Fixed to Off

"DLE EOT" **n = 118 = Transmit Paper Status In Real Time (Same command reply 1B 76)**

Bit	Status	Hex	Decimal	Function
0	Off	00	0	Paper adequate
	On	01	1	Paper low (if paper low sensor enabled)
1	Off	00	0	Cover closed.
	On	02	2	Cover Open.
2	Off	00	0	Receipt Paper Present.
2	On	04	4	Receipt Paper Out.
3	Off	00	0	Knife Home Position.
	On	08	8	Knife Not Home Position.
4	Off	00	0	Fixed to Off.
5	Off	00	0	Temperature in valid range.
	On	20	32	Temperature too hot or too cold.
6	Off	00	0	Voltage In valid range.
	On	40	64	Voltage Too high or too low.
7	Off	00	0	Fixed to Off.

DLE ENQ n - [MP]

10 05 n

Real Time Recovery from Fault

Synopsis: When the printer is an error status, this real time command recovery from a fault.

ASCII	DLE	ENQ	n
Hexadecimal	**10**	**05**	**n**
Decimal	16	5	n

Operand: n = Recovery mode

Limit Dec: $1 \le n \le 2$

Hex: $01 \le n \le 02$

See table n mode description below.

Description: This command will select the recovery mode when a fault condition is detected by the printer. Any fault condition that prevents the printer from any printing function requires one of these commands to allow printing to resume.

Notes: This command is equivalent to the 'GS ETX' command.

This command will attempt recovery from any fault that prevents printing.

Recovering from a print head under or over temperature condition is only accomplished by waiting until the print head has returned to its operating temperature range.

Recovering from a under or over voltage condition is only accomplished by waiting until voltage returned to its operating voltage range.

This command will be ignored until manual intervention has occurred to clear the fault condition.

"DLE ENQ" OPERAND DEFINITION		
n		
Decimal	**Hex**	**Fault recovery mode**
1	01	Restarts printing from the beginning of the line where a fault occurred, after recovering from the fault. Print settings that are normally preserved from line to line, such as character height and width, are still preserved with this operand.
2	02	Recovers from a fault after clearing the receive and print buffers. Print settings that are normally preserved from line to line, such as character height and width, are still preserved with this operand.

DLE ACK - [MP]

10 06

Real Time Current position count transmission

Synopsis: Real time current position.

ASCII	DLE	ACK
Hexadecimal	**10**	**06**
Decimal	16	6

Description: Immediately returns a single byte containing the current position count.

The count is calculated by adding the value for each of the bits that equal one (see table below).

Notes: The maximum range of the count will be from 0 – 63.

The returned count has bits 4 and 7 fixed to zero to avoid confusion with other returned data including XOn and XOff.

"DLE ACK" RETURNED COUNTER DEFINITION			
		Value	
Bit	**Function**	**0**	**1**
0	Bit 0 of count (LSB)	0	1
1	Bit 1 of count	0	2
2	Bit 2 of count	0	4
3	Bit 3 of count	0	8
4	Fixed	Always 0	-
5	Bit 4 of count	0	16
6	Bit 5 of count (MSB)	0	32
7	Fixed	Always 0	-

DLE EM n - [MP]
10 19 n
Extended Real Time Status Transmission

Synopsis: Immediately transmits the selected status.

ASCII	DLE	EM	n
Hexadecimal	**10**	**19**	**n**
Decimal	16	25	n

Operand: n = Status Select

Limit **Hex:** **Dec:** See description tables below

Hex:	Dec:	
0	0	Memory Allocation Status (reply 1 byte).
1	1	Printer Status (reply 1 byte).
2	2	Error Status (reply 1 byte).
3	3	No defined (Reply 1 byte = 0x80).
4	4	Environmental Status (reply 1 byte).
5	5	Print buffer Status (reply 2 bytes).
6	6	Communication receives buffer status (reply 2 bytes).
7	7	Print command processing data (reply 2 bytes).
8	8	Clear counter of processed print commands (no reply).
9	9	Clear SRAM and Flash memory allocation error (no reply).
A	10	Return serial number (reply 10 bytes).
B	11	Return printer software revision (reply 8 bytes).
C	12	Return model number (reply 15 bytes).

Description: Transmits the selected x byte(s) printer status specified by n in Real Time according to the following parameters.

Notes:

- The command is ignored if *n* is out of range.
- The printer reset bit will be zero after the reset condition has been reported to the host for the first time.
- The packet frame status bit indicates whether a packet sequence (i.e. STX data ETX checksum) was in error.
- A packet error is indicated when a packet larger than the input buffer is received.
- The awaiting error recovery command status indicates that a fault condition existed and was cleared. The “DLE ENQ” or “GS ETX” command must be sent to clear the fault condition.
- The counter of Processed Print Commands “DLE EM 07” is incremented when processing any command that generates a paper motion, ie print or paper feed commands.
- Commands DLE EM 05, 06, 07, 08 are designed to help user application monitor the contents of main buffers, for example in default condition.

“DLE EM” *n* = 0: MEMORY ALLOCATION STATUS			
		Value	
Bit	**Function**	**0**	**1**
0	Flash Memory Error	OK	Failure
1	Sram Memory Error	OK	Failure
2	Undefined	-	-
3	Undefined	-	-
4	Fixed	Always 0	-
5	Undefined	-	-
6	Undefined	-	-
7	Fixed	-	Always 1

"DLE EM" *n* = 1: PRINTER STATUS			
		Value	
Bit	Function	0	1
0	Paper status (2) Presenter paper output detector paper status	Present Present	Out Out
1	Reserved	-	-
2	Packet frame status (1)	OK	Failure
3	(2) Presenter paper input detector paper status	Present	Out
4	Fixed	Always 0	-
5	Packet Checksum Status (1)	OK	Failure
6	Printer reset (1)	Reported	Reset
7	Fixed	-	Always 1

(1) The printer reset bit will be zero after the reset condition has been reported to the host for the first time.
(2) Only if presenter option enabled see command <1D 49 32>.

(1)The printer reset bit will be zero after the reset condition has been reported to the host for the first time.

"DLE EM" *n* = 2: ERROR STATUS			
		Value	
Bit	Function	0	1
0	Presenter error status(2)	OK	Failure
1	Paper Jam Status	OK	Jammed
2	Packet Error (1)	OK	Failure
3	Door Status	Closed	Open
4	Fixed	Always 0	-
5	TOF Detection Status	OK	Failure
6	Ticket Ejector Status (2)	OK	Failure
7	Fixed	-	Always 1

"DLE EM" *n* = 4: ENVIRONMENTAL STATUS			
		Value	
Bit	Function	0	1
0	Power Supply Voltage Status	OK	Failure
1	Print head Temperature Status	OK	Failure
2	Undefined	-	-
3	Undefined	-	-
4	Fixed	Always 0	-
5	Undefined	-	-
6	Undefined	-	-
7	Fixed	-	Always 1

"DLE EM" *n* = 5: PRINT BUFFER STATUS	
Byte	Function
0	(LSB) Number of raster left in Print Buffer
1	(MSB) Number of raster left in Print Buffer

"DLE EM" *n* = 6: COMMUNICATION RECEIVE BUFFER STATUS	
Byte	Function
0	(LSB) Number of bytes left in Receive Buffer
1	(MSB) Number of bytes left in Receive Buffer

"DLE EM" *n* = 7: PRINT COMMANDS PROCESSING STATUS	
Byte	Function
0	(LSB) Number of processed Print Commands
1	(MSB) Number of processed Print Commands

"DLE EM" RETURNED STATUS DEFINITION
***n* = 8: CLEAR COUNTER OF PROCESSED PRINT COMMANDS**

"DLE EM" RETURNED STATUS DEFINITION
***n* = 9: CLEAR SRAM AND FLASH MEMORY ALLOCATION ERROR**

"DLE EM" RETURNED STATUS DEFINITION *n* = 10: PRINTER SERIAL NUMBER	
Byte	**Function**
0-9	Printer Serial Number

"DLE EM" RETURNED STATUS DEFINITION *n* = 11: PRINTER SOFTWARE REVISION	
Byte	**Function**
0-17	Boot and Flash Software Revision (Same Reply command 1F 56).

"DLE EM" RETURNED STATUS DEFINITION *n* = 12: MODEL NUMBER	
Byte	**Function**
0-14	Printer Model Number

DC1 n1…nX - [MP]
11 n1…n*X*
Print Raster Graphics

Synopsis: Print raster graphics.

ASCII	DC1	n…nX
Hexadecimal	**11**	**n…nX**
Decimal	17	n1…nX

Value of n: n1…nX = 48 Data bytes if 448 dots (60mm paper width),
72 Data bytes if 576 dots (80mm paper width)
80 Data bytes if 640 dots (82.5mm paper width)

Range: 0 – 255

Description: Prints one row of data. *n*1 ... *n*X: bytes describing the line to print *n*X=48.

Notes: See also command Set GFX Print Area Width modified *n*X <1F 0A 8B *n*>.
Raster graphics is not available in Page Mode.

DC2 - [MP]
12
Select Double-Wide Characters

Synopsis: Select Double-Wide Characters.

ASCII	DC2	
Hexadecimal	**12**	
Decimal	18	

Description: Prints double-wide characters. The printer is reset to single-wide mode after a line has been printed or the Clear Printer (10) command is received. Double-wide characters may be used in the same line with single-wide characters.

Note : Double-wide characters may not be used in the same line with single or double-density graphics.

DC3 - [MP]

13

Select Single-Wide Characters

Synopsis:	Select Single-Wide Characters.
ASCII	DC3
Hexadecimal	**13**
Decimal	19
Description:	Prints single-wide characters. Single-wide characters may be used in the same line with double-wide characters.
Note :	Single-wide characters may not be used in the same line with single or double-density graphics.

DC4 n - [MP]

14 n

Feed n Print Lines

Synopsis:	Feed n print lines.	
ASCII	DC4	n
Hexadecimal	**14**	**n**
Decimal	20	n
Value of *n*	The number of lines to feed at current line height setting.	
Range of *n*	0-255	
Description:	Feeds the paper *n* lines at the current line height without printing.	
Note:	Ignored if not at start of line.	

NAK n - [MP]

15 n

Feed n Dots Rows

Synopsis:	Feed n dots rows.	
ASCII	NAK	n
Hexadecimal	**15**	**n**
Decimal	21	n
Value of n:	n/203 inch	
Range:	0 – 255	
Description:	Feeds the paper *n* dot rows (*n*/203 inch, *n*/8 mm), without printing.	

SYN n - [MP]

16 n

Add n Extra dot Rows

Synopsis: Add n extra dot rows.

ASCII	SYN	n
Hexadecimal	**16**	**n**
Decimal	22	n

Value of n: Number of extra dot rows

Range: 0-16

Default: 3 extra dot rows.

Description: Adds *n* extra dot rows (*n*/203 inch, *n*/8 mm) to the character height to increase space between print lines or decrease the number of lines per inch.

Formulas: The following table shows the relationship between the number of lines per inch and each extra dot row added:

Extra Rows	Lines Per Inch	Dot Rows
0	8.5	24
1	8.1	25
2	7.8	26
3	7.5	27
4	7.2	28
5	7.0	29
6	6.8	30
7	6.5	31
8	6.3	32

Extra Rows	Lines Per Inch	Dot Rows
9	6.1	33
10	6.0	34
11	5.8	35
12	5.6	36
13	5.5	37
14	5.3	38
15	5.2	39
16	5.1	40

ETB - [MP]

17

Print one line

Synopsis: Print.

ASCII	ETB
Hexadecimal	**17**
Decimal	23

Description: Prints one line from the buffer and feeds paper one line.

CAN - [MP]

18

Cancel Print Data in Page mode

Synopsis:	Cancel print data in page mode.
ASCII	CAN
Hexadecimal	**18**
Decimal	24
Description:	Deletes all the data to be printed in the “page” area. Any data from the previously selected “page” area that is also part of the current data to be printed is deleted.
Note:	This command is only used in page mode.

EM - [MP] / ESC i - [MP]

19

ESC i

Perform Full Knife Cut

Synopsis:	Cuts the receipt.		
ASCII	EM	ESC	i
Hexadecimal	**19**	**1B**	**69**
Decimal	25	27	105
Description:	Use either Hex 19 or Hex 1B 69. There are two codes for this command. Both codes perform the same function.		
Note:	-		

SUB - [MP] / ESC i - [MP]

1A

ESC m

Perform Partial Knife Cut

Synopsis:	Partially cuts the receipt.		
ASCII	SUB	ESC	m
Hexadecimal	**1A**	**1B**	**6D**
Decimal	26	27	109
Description:	The lengtg of the cut be changed through the configuration menu. The default setting leaves 0.08 inches (2 mm) of paper on the left edge. See setting Partial cut distance in diagnostics. Use either Hex 1A or Hex 1B 6D. There are two codes for this command. Both codes perform the same function.		
Note:	The command is valid only at the beginning of a line.		

ESC FF - [MP]

1B 0C

Print Data in Page Mode

Synopsis:	Print Data	
ASCII	ESC	FF
Hexadecimal	**1B**	**0C**
Decimal	27	12

Description: Collectively prints all buffered data in the printing area.

After printing, the printer does not clear the buffered data and sets values for Select Print Direction in Page Mode (ESC T) and Set Print Area in Page Mode (SUB ESC W), and sets the position for buffering character data.

Note : This command is enabled only in page mode.

ESC DC2 - [MP]

1B 12

Select 90 Degree Counter-Clockwise Rotated Print

Synopsis:	Rotate characters counter-clockwise.	
ASCII	ESC	DC2
Hexadecimal	**1B**	**12**
Decimal	27	18

Description: Rotates characters 90 degrees counter-clockwise. The command remains in effect until the printer is reset or until a Clear Printer (10) or Cancel Rotated Print (1B 56) command is received.

ESC DC4 n - [MP]

1B 14 n

Set Column

Synopsis:	Set Column.		
ASCII	ESC	DC4	n
Hexadecimal	**1B**	**14**	**n**
Decimal	27	20	n

Limit n : 1-28 = Standard pitch (Elite character).

1-37 = Compressed pitch (Pica character).

Default : n = 1 (decimal)

Description: Prints the first character of the next print line in column *n*. It must be sent for each line not printed at column one. The value of *n* is set to one after each line.

Note: This command cannot be used with Single- or Double-Density graphics.

ESC SYN n - [MP]
1B 16 n
Select pitch (Column Width)

Synopsis: Select pitch for Column width.

ASCII	ESC	SYN	n
Hexadecimal	**1B**	**16**	**n**
Decimal	27	22	n

Value of n 0 = Standard pitch.
1 = Compressed pitch.

Default 0 (Standard pitch).

Description: Selects the character pitch for a print line.

Formulas The following table provides the print characteristics for both pitches.

Pitch	Columns 82.5mm 640 dots	Columns 80mm 576 dots	Columns 60mm 448 dots
Standard (16x24)	40	36	28
Compressed (12x24)	53	48	37

ESC SP n - [MP]
1B 20 n
Set Right-Side Character Spacing

Synopsis: Set right-side character spacing.

ASCII	ESC	SP	n
Hexadecimal	**1B**	**20**	**n**
Decimal	27	32	n

Range of n : 0 - 32

Default 0

Description: Sets the right side character spacing to [*n* x horizontal or vertical motion units]. Values for this command are set independently in standard and page mode.

The units of horizontal and vertical motion are specified by the Set Horizontal and Vertical Minimum Motion Units (GS P) command. Changes in the horizontal or vertical units do not affect the current right side character spacing. When the horizontal or vertical motion unit is changed by the Set Horizontal and Vertical Minimum Motion Units (GS P) command the value must be in even units and not less than the minimum amount of horizontal movement.

In standard mode the horizontal motion unit is used.

In page mode the horizontal or vertical motion unit differs and depends on the starting position of the printable area. When the starting printing position is the upper left or lower right of the printable area (set by Select Print Direction in Page Mode, ESC T) the horizontal motion unit (*x*) is used. When the starting printing position is the upper right or lower left of the printable area (set by Select Print Direction in Page Mode, ESC T) the vertical motion unit (*y*) is used.

ESC ! n - [MP]

1B 21 n

Select Print Mode

Synopsis:	Select print mode.		
ASCII	ESC	!	n
Hexadecimal	**1B**	**21**	**n**
Decimal	27	33	n

Value of *n* See table above.

Range of *n* 0-255

Default 0 (for bits 1, 3, 4, 5, 7).

Description: Selects the print mode: Standard, compressed, emphasized, underlined, double high or double wide.

Value of *n*

Bit[1]	Function	0	1
Bit 0	Pitch (See chart below)	Standard Pitch	Compressed Pitch
Bit 3	Emphasized Mode	Cancelled	Set
Bit 4	Double High	Cancelled	Set
Bit 5	Double Wide	Cancelled	Set
Bit 7	Underlined Mode	Cancelled	Set (bar thickness = 2)

[1] Bits 1, 2 and 6 are not used “0”.

Pitch	Columns 82.5mm 640 dots	Columns 80mm 576 dots	Columns 60mm 448 dots
Standard (16x24)	40	36	28
Compressed (12x24)	53	48	37

ESC $ nL nH - [MP]
1B 24 nL nH
Set Absolute Starting Position

Synopsis: Set absolute starting position.

ASCII	ESC	$	nL	nH
Hexadecimal	**1B**	**24**	**nL**	**nH**
Decimal	27	36	nL	nH

Value of n:
nn = Number of dots to be moved from the beginning of the line.
nL = Remainder after dividing *n* by 256
nH = Integer after dividing *n* by 256
The values for *nL* and *nH* are two bytes in low byte, high byte word orientation: ((nH * 256) + nL).

Description:
Sets the print starting position to the specified number of dots (up to the right margin) from the beginning of the line. The print starting position is reset to the first column after each line.
If the Set horizontal and vertical Minimum Motion Units command (1D 50) is Used to change the horizontal and vertical minimum motion unit, the parameters of this command (Set Absolute Print Position) will be interpreted accordingly.
Any setting that exceeds the printable area is ignored.

Note:
This command is also used in graphics mode. See Graphics Commands in this document for more information.
For more information, see the description of the Set horizontal and vertical Minimum Motion Units Command (1D 50) in this document.

Formulas:
The example shows how to calculate 280 dots as the absolute starting position :
280/256 = 1, remainder of 24 *nL* = 24 *nH* = 1

ESC % n - [MP]
1B 25 n
Select Character Set

Synopsis: Select character set.

ASCII	ESC	%	n
Hexadecimal	**1B**	**25**	**n**
Decimal	27	37	n

Value of n :
0 = Code Page 437.
1 = User Defined (RAM).
2 = Code Page 850.

Range of n : 0 – 2

Default : 0 (Code Page 437).

Description:
Selects the character set. When an undefined RAM character is selected, current active ROM Code Page character is used.

ESC & s c1 c2 n1 d1 … nn dn - [MP]

1B 26 s c1 c2 n1 d1 … nn dn

Define User-Defined Character Set

Synopsis: Defines characters download in RAM.

ASCII	ESC	&	s	c1	c2	[*n*1]	d1…	…	[*n*n]	dn
Hexadecimal	**1B**	**26**	**s**	**c1**	**c2**	**[*n*1]**	**d1**	**…**	**[*n*n]**	**dn**
Decimal	27	38	s	c1	c2	[*n*1]	d1	…	[*n*n]	dn

Value and Ranges :

s = 3, the number of bytes (vertically) in the character cell.

c = the ASCII codes of the first *(c*1) and last (*c*2) characters respectively

*c*1 = Hex 20-FF (20 is always printed as a space).

*c*2 = Hex 20-FF (20 is always printed as a space).

To define only one character, use the same code for both *c*1 and *c*2.

n = the number of dot columns for the nth character as specified by [*n*1] ... [*n*n]

n = 1-16.

d = the column data for the nth character as specified by *d*1 ... *d*n

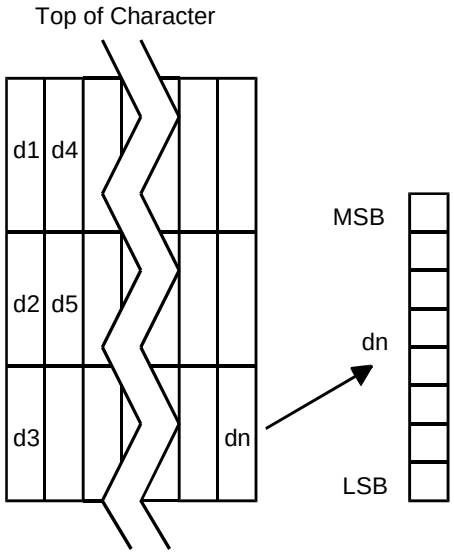
The number of bytes for a character cell is *s* x *n*1.

The bytes are printed down and across each cell. See the illustration below.

Description: Defines and enters downloaded characters into RAM. The command may be used to overwrite single characters. User-defined characters are available until power is turned off or the Initialize printer command (1B 40) is received.

Note: Any invalid byte (*s*, *c*1, *c*2, *n*1, *n*2) aborts the command.

See (1D 22 n) “Select memory type” to save User Defined characters.



ESC ‘ m a2 a1 a0 d1 …dm - [MP]
1B 27 m a2 a1 a0 d1 … dm
Write to User Data Storage

Synopsis:	Write to user data storage.								
ASCII	ESC	‘	m	a2	a1	a0	d1	…	dm
Hexadecimal	**1B**	**27**	**m**	**a2**	**a1**	**a0**	**d1**	**…**	**dm**
Decimal	27	39	m	a2	a1	a0	d1	…	dm

Value of :

m 0 – 255 (Number of bytes).
Up to 256 bytes (256 for m=0) may be written.

Addr (65536 x a2) + (256 x a1) + a0

Description: Writes *m* bytes of data to the user data storage flash page at the address specified. The printer waits for *m* bytes of data following the 3-bytes address, *addr*.

Exception: If any of the memory locations addressed by this command are not currently erased, the command is not executed.

ESC * m n1 n2 d1 …dn - [MP]
1B 2A m n1 n2 d1 …dn
Select Bit Image Mode

Synopsis:	Select bit image mode.							
ASCII	ESC	*	m	n1	n2	d1	…	dn
Hexadecimal	**1B**	**2A**	**m**	**n1**	**n2**	**d1**	**…**	**dn**
Decimal	27	42	m	n1	n2	d1	…	dn

For 80mm paper:

Value of m	Mode	No. of Dots (Vertical)	No. of Dots (Horizontal)	No. of Dots/Line
0	8 Dot Single Density	8 (68 DPI)	0-288 (101 DPI)	8 x 288
1	8 Dot Double Density	8 (68 DPI)	0-576 (203 DPI)	8 x 576
32	24 Dot Single Density	24 (203 DPI)	0-288 (101 DPI)	24 x 288
33	24 Dot Double Density	24 (203 DPI)	0-576 (203 DPI)	24 x 576

For 82.5mm paper:

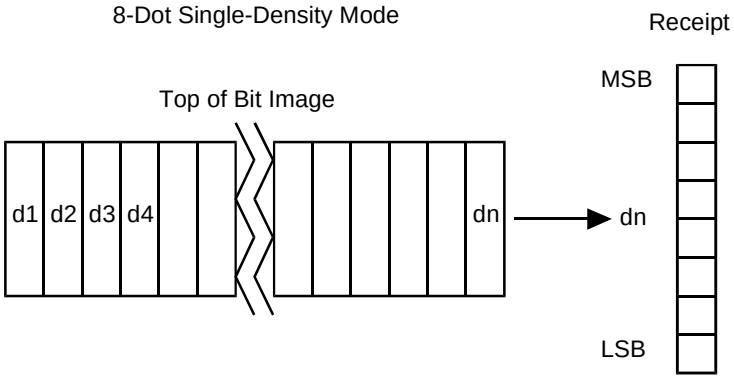
Value of m	Mode	No. of Dots (Vertical)	No. of Dots (Horizontal)	No. of Dots/Line
0	8 Dot Single Density	8 (68 DPI)	0-320 (101 DPI)	8 x 320
1	8 Dot Double Density	8 (68 DPI)	0-640 (203 DPI)	8 x 640
32	24 Dot Single Density	24 (203 DPI)	0-320 (101 DPI)	24 x 320
33	24 Dot Double Density	24 (203 DPI)	0-640 (203 DPI)	24 x 640

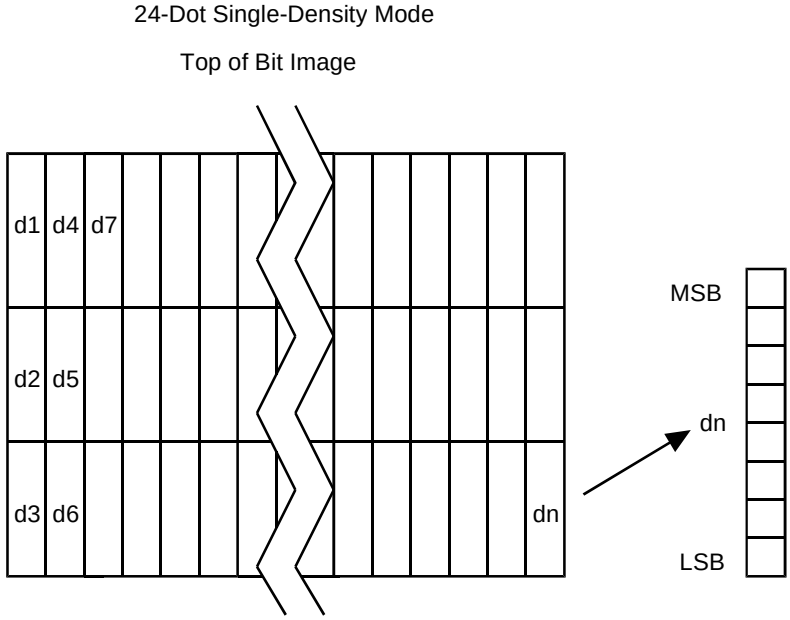
Value of n	(8-Dot Single Density Mode)	(24-Dot Single Density Mode)
	*n*1 + (256 x *n*2)	3 x [*n*1 + (256 x *n*2)]

Value of *d* Number of Bytes of Data (Printed Down, Then Across)

Description: Sets the print resolution and enters one line of graphics data into the print buffer. Excess data is accepted but ignored. Any print command is required to print the data, after which the printer returns to normal processing mode.

Note : See below the illustrations for graphic representations of the bit image.





ESC + - [MP]
1B 2B

Increment Current Position Count

Synopsis:	Increment current position count.	
ASCII	ESC	+
Hexadecimal	**1B**	**2B**
Decimal	27	43

Description: A buffered command that increments the current position count.

Note : If the count is 63 when it is incremented, the count will become 0.

ESC - n - [MP]
1B 2D n
Select or Cancel Underline Mode

Synopsis:	Select or cancel underlined mode.		
ASCII	ESC	-	n
Hexadecimal	**1B**	**2D**	**n**
Decimal	27	45	n

Value of *n:*

0-48	= Cancel underline mode.
1- 7,49-55	= Select underline mode and bar thickness in number of dots.

Default: 0-48 (Cancel underline mode).

Description: Turns underline mode on or off. Underlines cannot be printed for spaces set by the Horizontal Tab, Set Absolute Start Position, or Set Relative Print Position commands.

Underline mode may also be turned ON and OFF with the Select Print Mode(s) command (1B 21). However with that command the bar thickness is not selectable.

Note : This command is ignored if n is out of the specified range.

ESC . m n rL rH d1 … dn - [MP]

1B 2E m n rL rH d1 … dn

Print Advanced Raster Graphics

Synopsis: Print advanced raster graphics.

ASCII	ESC	.	m	n	rL	rH	d1	…	dn
Hexadecimal	**1B**	**2E**	**m**	**n**	**rL**	**rH**	**d1**	**…**	**dn**
Decimal	27	46	m	n	rL	rH	d1	…	dn

Value of m : Horizontal offset from left margin = 8 x m dots.

Value of n : Number of data bytes that compose the raster.

Value of r : Number of times the raster has to be printed = 256 x rH + rL.

d1 … dn : Data bytes.

Range:

$0 \leq m \leq Nx$

$0 \leq n \leq Nx$

$0 \leq r \leq 65535$

$0 \leq d1 \ldots dn \leq 255$

Nx= 56 Data bytes if 448 dots (60mm paper width),
72 Data bytes if 576 dots (80mm paper width)
80 Data bytes if 640 dots (82.5mm paper width)

Prints a horizontal raster of graphics data one or multiple times. Horizontal offset and number of data bytes are variable and specified by parameters.

Note : Advanced Raster graphics is not available in Page Mode.

ESC 2 - [MP]

1B 32

Set Line Spacing to 1/6 Inch

Synopsis:	Set line spacing to 1/6 inch.	
ASCII	ESC	2
Hexadecimal	**1B**	**32**
Decimal	27	50

Description: Sets the default line spacing to 1/6 of an inch (4, 23 mm).

ESC 3 n - [MP]

1B 33 n

Set Line Spacing

Synopsis:	Set line spacing.		
ASCII	ESC	3	n
Hexadecimal	**1B**	**33**	**n**
Decimal	27	51	n

Value of *n* n/406 inch

Range of *n* 0-255

Default 0.13 inch (3.37 mm)

Description: Sets the line spacing to *n*/406 inch (*n*/16 mm).
The minimum line spacing is 8.5 lines per inch. The line spacing equals the character height when n is too small.

ESC 4 m a2 a1 a0 - [MP]

1B 34 m a2 a1 a0

Read from User Data Storage

Synopsis:	Read from user data storage.					
ASCII	ESC	3	m	a2	a1	a0
Hexadecimal	**1B**	**34**	**m**	**a2**	**a1**	**a0**
Decimal	27	51	m	a2	a1	a0

Value of *m* : 0-255 (Number Bytes)
Up to 256 bytes (256 for m=0) may be reads.

Addr : (65536 x a2) + (256 x a1) + a0

Description: Reads *m* bytes of data to the user data storage flash page at the address specified.
End read send a Carriage Return (0x0D).

ESC : 0 0 0 - [MP]
1B 3A 30 30 30
Copy Character Set from Rom to Ram

Synopsis:	Copy character set from Rom to Ram.				
ASCII	ESC	:	0	0	0
Hexadecimal	**1B**	**3A**	**30**	**30**	**30**
Decimal	27	58	48	48	48

Default : Current active ROM Code Page.

Description: Copies characters in the active ROM set to RAM. Use this command to re-initialize the User-Defined Character Set.

Note: To modify characters in one of the character set variations, such as Rotated Print, Select one of the Rotated Print commands, copy to RAM, then use the Define User-Defined Character Set command (1B 26).

If font Selected is User-Defined, the command is ignored.

ESC = n - [MP]
1B 3D n
Select Peripheral Device (for Multi Drop)

Synopsis:	Select peripheral device.		
ASCII	ESC	=	n
Hexadecimal	**1B**	**3D**	**n**
Decimal	27	61	n

Value of n 0 (bit 0), device not selected.
1 (bit 0), device selected.

Default : 1 (bit 0), device selected.

Description: Selects the device to which the host computer sends data.
When the printer is disabled by this command, it ignores transmitted data until the printer is re-enabled by the same command.

Note: Other bits of n (1-7) are undefined and ignored.

ESC ? n - [MP]

1B 3F n

Cancel User-Defined Character

Synopsis:	Cancel Patern defined character .		
ASCII	ESC	?	n
Hexadecimal	**1B**	**3F**	**n**
Decimal	27	63	n

Range : 32-255

Description : Cancels the pattern defined for the character code specified by n.After the user-defined character is canceled, the corresponding pattern from current active ROM code Page is printed.

Exceptions : This command is ignored if n is out of range or if the user-defined character is not defined.

ESC @ - [MP]
1B 40
Initialize Printer

Synopsis: Initialize printer.

ASCII	ESC	@
Hexadecimal	**1B**	**40**
Decimal	27	64

Description: Clears the print line buffer and resets the printer to the default settings for the startup configuration (refer to Default settings below).

Single-Wide, Single-High, Non-Rotated, and Left-Aligned characters are set and User-defined characters or logo graphics are cleared (in Volatile memory).

Default: Single Wide, Single-High and Left-Aligned characters.

Character Set	Default (1)	
	16*24 (Elite)	12*24 (Pica)
Number of Columns Width	28 (1)	37 (1)
Character Pitch	12.70 CPI (1)	16.93 CPI (1)
Extra Dot Rows	0	4
Code Page	(437) (2)	
Printing Position	Column One	

(1) Mode resident user m=0 see code Set default font 1F 03 0F m or Read default font with 1F 07 0F.
(2) Select Code Page, see command Read default code page with 1F 07 80. or Set default code page with command 1F 03 80 m.

ESC "BMP file" - [MP]
1B 42 4D …
Download BMP Logo

Synopsis: Download BMP file.

ASCII	ESC	B	M	…	ESC	"BMP File"
Hexadecimal	**1B**	**42**	**4D**	**…**	**1B**	**"BMP File"**
Decimal	27	66	77	…	27	"BMP File"

Value Maximum width = 448 for 58 or 60mm paper.

Description: Enters a downloaded BMP logo into RAM or Flash.

The downloaded BMP logo can be printed by using the Print Downloaded Image (1D 2F n) command. To download a BMP file to save it as a logo, send the ESC (1Bh) character followed by the whole BMP file.

The printer decodes the BMP file header and will save the image data after checking important parameters, such as :

- Width.
- Height.
- Number of colours (only monochrome images are accepted).

Note: BMP file images that are not monochrome are ignored.

Microsoft BMP bitmap file format.

See command "Return Logo Checksum" (1F 65 n)

See also chapter "Memory allocation" for information about potential limitations.

ESC D [n]…k NUL - [MP]
1B 44 [n]…k NUL
Set Horizontal Tab Positions

Synopsis:	Set horizontal tab positions.				
ASCII	ESC	D	[n]	…k	NUL
Hexadecimal	**1B**	**44**	**[n]**	**…k**	**0**
Decimal	27	68	[n]	…k	0

Value of n: Column number for tab minus one
(*n* is always less than or equal to the current selected column width)

Value of k: 0-32

Default: Every 8 characters from column. 1 (9, 17, etc.) for normal print

Description: Sets up to 32 horizontal tab-position n columns from column one, but does not move the print position. See the Horizontal Tab command (09).

The tab positions remain unchanged if the character widths are changed after the tabs are set. The command ends with hexadecimal 00; hexadecimal (1B 44 00) clears all tabs.

The tabs cannot be set higher than the column width of the current pitch.

Formulas: Set the tab positions in ascending order and put Hex 00 at the end.
Hex (1B 44 00) number of tabs not specified, clears all tab positions.

Example: 1B 44 03 04 07 0A 0D 18 00
09 41 09 42 09 43 09 44 09 45 09 46 0A
To obtain (in standard pitch): ---A---B--C--D----------EF

ESC E n - [MP]
1B 45 n
Select or cancel Emphasized Mode

Synopsis:	Turn emphasized mode on/off.		
ASCII	ESC	E	n
Hexadecimal	**1B**	**45**	**n**
Decimal	27	69	n

Value of n 0 = Off
1 = On (When 0 and 1 are the Least Significant Bit, LSB)

Default: 0 (Off)

Description: Starts or stops emphasized printing. The printer is reset to the standard print mode after a Clear Printer (10) command is received.

Note: Only the lowest bit of n is effective.
Emphasized printing cannot be used with bit-images or downloaded bit-images.

This command and the Select Print Mode(s) command (1B 21) function identically. They should have the same setting when used together.

ESC G n - [MP]

1B 47 n

Select or Cancel Double Strike

Synopsis:	Turn double strike mode On/Off.		
ASCII	ESC	G	n
Hexadecimal	**1B**	**47**	**n**
Decimal	27	71	n
Value of n	0 = Off 1 = On	(When 0 and 1 are the Least Significant Bit, LSB)	
Default:	0 (Off)		
Description:	Turns double strike mode on or off. Identical to Emphasized mode. The printer is reset to the standard print mode after a Clear Printer (10) command is received.		
Note:	Only the lowest bit of n is effective. Double-strike printing cannot be used with bit-images or downloaded bit-images.		

ESC I n - [MP]

1B 49 n

Select or Cancel Italic Print

Synopsis:	Turn Italic mode On/Off.		
ASCII	ESC	I	n
Hexadecimal	**1B**	**49**	**n**
Decimal	27	73	n
Value of n	0 = Off 1 = On	(When 0 and 1 are the Least Significant Bit, LSB)	
Default:	0 (Off)		
Description:	Turns Italic print mode on or off. The printer is reset to the standard print mode after a Clear Printer (10) command is received.		
Note:	Only the lowest bit of n is valid.		

ESC J n - [MP]

1B 4A n

Print And Feed paper

Synopsis:	Print and feed paper.		
ASCII	ESC	J	n
Hexadecimal	**1B**	**4A**	**n**
Decimal	27	74	n

Value of *n* *n*/203 inch

Range of *n* 0-255

Description: Prints one line from the buffer and feeds the paper n/203 inch (n/8 mm). The line height equals the character height when n is too small.

If the Set Horizontal and Vertical Minimum Motion Units command (1D 50) is used to change the horizontal and vertical minimum motion units, the parameters of this command (Print and Feed Paper) will be interpreted accordingly.

ESC K n1 n2 d1 … dn - [MP]

1B 4B n1 n2 d1 … dn

Select Single Density Graphics

Synopsis:	Select single density graphics.						
ASCII	ESC	K	n1	n2	d1	…	dn
Hexadecimal	**1B**	**4B**	**n1**	**n2**	**d1**	**…**	**dn**
Decimal	27	75	n1	n2	d1	…	dn

Value of n

(8-Dot Single Density Mode) *n*1 + (256 x *n*2)

(24-Dot Single Density Mode) 3 x [*n*1 + (256 x *n*2)]

Value of *d* Number of Bytes of Data (Printed Down, Then Across)

Description: Enters one line of 8-dot single-density graphics into the print buffer. Any print command is required to print the line, after which the printer returns to normal processing mode. EX: Single-density mode allows 0-192 dot columns for 58 mm paper.

Each bit corresponds to two horizontal dots. Compare to Set Bit Image Mode (1B 2A, m=0) earlier in this document.

ESC L - [MP]
1B 4C
Select Page Mode

Synopsis:	Select page mode.	
ASCII	ESC	L
Hexadecimal	**1B**	**4C**
Decimal	27	76

Description:

Switches from standard mode to page mode. After printing has been completed either by the Print and Return to Standard Mode (FF) command or Select Standard Mode (ESC S) the printer returns to standard mode. The developed data is deleted after being printed.

This command sets the position where data is buffered to the position specified by Select Print Direction in Page Mode (ESC T) within the printing area defined by Set Print Area in Page Mode (ESC W).

This command switches the settings for the following commands (which values can be set independently in standard mode and page mode) to those for page mode.

- Set Right-Side Character Spacing (ESC SP)
- Select 1/6-Inch Line Spacing (ESC 2)
- Set Line Spacing (ESC 3)

It is possible only to set values for the following commands in page mode. These commands are not executed.

- Select or Cancel 90 Degree Clockwise Rotation (ESC V)
- Set Counter Clockwise Rotation (ESC DC2)
- Select Justification (ESC a)
- Select or Cancel Upside-Down Printing (1B 7B).
- Set Left Margin (SUB GS L)
- Set Print Area Width (SUB GS W)

Note:

The command is enabled only when input at the beginning of a line

The command has no effect if page mode has previously been selected.

Default first Windows 50mm (x= 348 dots ; y = 400dots lines).

ESC R n - [MP]

1B 52 n

Select International Character Set

Synopsis: Select international character set.

ASCII	ESC	R	n
Hexadecimal	**1B**	**52**	**n**
Decimal	27	82	n

Operand: n = mode selection.

Limits :

n		Code Page
Decimal	**Hex**	
0	00	437 : US
1	01	850 : Multilingual
2	02	852 : Latin 2, Slavic
3	03	860 : Portuguese
4	04	863 : Canadian French
5	05	865 : Nordic
6	06	858 : Multilingual Latin 1 + Euro
7	07	866 : Cyrillic, Russian
8	08	1252 : Windows, Latin 1
9	09	862 : Hebrew
10	0A	Katakana
11	0B	1253 : Windows, Greek
21	0C	737 : Greek
48	30	Easy Font Single Byte 0.
49	31	Easy Font Single Byte 1.
50	32	Easy Font Single Byte 2.
51	33	Easy Font Single Byte 3.

Default: 0 (Code Page 437).

Description: Selects the character set to be used.

Note: Set default Code Page 437, selectable through configuration menu with code 1F 03 80 n (= 0).

Same command (1B 74 n).

ESC S - [MP]

1B 53

Select Standard Mode

Synopsis: Select standard Mode (Cancel page mode).

ASCII	ESC	S
Hexadecimal	**1B**	**53**
Decimal	27	83

Description: Switches from page mode to standard mode. In switching from page mode to standard mode, data buffered in page mode are cleared, the printing area set by Set Print Area in Page Mode (SUB ESC W) is initialized and the print position is set to the beginning of the line.

This command switches the settings for the following commands (the values for these commands can be set independently in standard mode and page mode) to those for standard mode:

Set Right-Side Character Spacing (ESC SP)

Select 1/6 Inch Line Spacing (ESC 2)

Set Line Spacing (ESC 3)

Standard mode is automatically selected when power is turned on, the printer is reset, or the Initialize Printer command (ESC @) is used.

Note: This command is effective only in page mode.

ESC T n - [MP]

1B 54 n

Select Print Direction in Page Mode

Synopsis: Select print direction in page mode.

ASCII	ESC	T	n
Hexadecimal	**1B**	**54**	**n**
Decimal	27	84	n

Value of n Start position

0 = Upper left corner proceeding across page to the right (A).

1 = Lower left corner proceeding up the page (B).

2 = Lower right corner proceeding across page to the left (upside down) (C).

3 = Upper right corner proceeding down page (D).

Default: 0

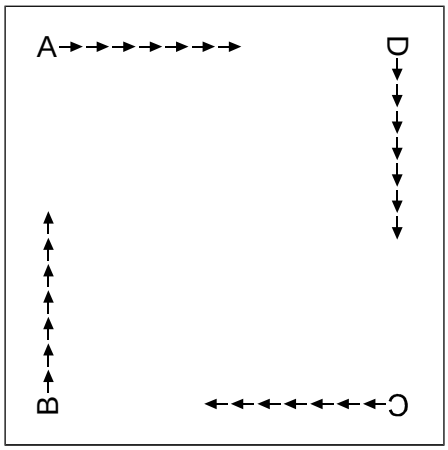
Description: Selects the printing direction and start position in page mode. See the illustration below.

The command can be sent multiple times so that several different print areas, aligned in different print directions, can be developed in the printer's page buffer before being printed using the Print

Page Mode commands (FF or ESC FF).

Note: The command is valid only in page mode.

The command is ignored if the value of n is out of the specified range.



ESC V n - [MP]

1B 56 n

Select or Cancel 90 Degree Clockwise Rotated Print

Synopsis:	Turn 90 degree clockwise mode on/off.		
ASCII	ESC	V	n
Hexadecimal	**1B**	**56**	**n**
Decimal	27	86	n

Value of n	0	= Cancel.
	1	= Set.
Default:	0	(Cancel)

Description: Rotates characters 90 degrees clockwise. The command remains in effect until the printer is reset or until a Clear Printer (10) or Rotated Print (1B 12) command is received.

ESC W xL xH dxL dxH dyL dyH - [MP]

1B 57 xL xH dxL dxH dyL dyH

Set Printing Area in Page Mode

Synopsis:	Set printing area in page mode.									
ASCII	ESC	W	xL	xH	yL	yH	dxL	dxH	dyL	dyH
Hexadecimal	**1B**	**57**	xL	xH	yL	yH	dxL	dxH	dyL	dyH
Decimal	27	87	xL	xH	yL	yH	dxL	dxH	dyL	dyH

Range of *_x_ ,_ y_* 0-255

Default xL = xH = yL = yH = 0

dyL = 128; dyH = 1 ➔ Dy size =640. (82.5 paper Width)

Description: Sets the position and size of the printing area in page mode.

The command can be sent multiple times so that several different print areas, aligned in different print directions, can be developed in the printer's page buffer before being printed using the Print Page Mode commands (ESC FF).

Formulas: The starting position of the print area is the upper left of the area to be printed (x0, y0). The length of the area to be printed in the y direction is set to dy inches. The length of the area to be printed in the x direction is set to dx inches. Use the equations to determine the Value of x0, y0, dx, and dy.

See the illustration for a graphic representation of the printing area. For more information about the fundamental calculation pitch, see the Set Horizontal and Vertical Motion Units command (1D 50).

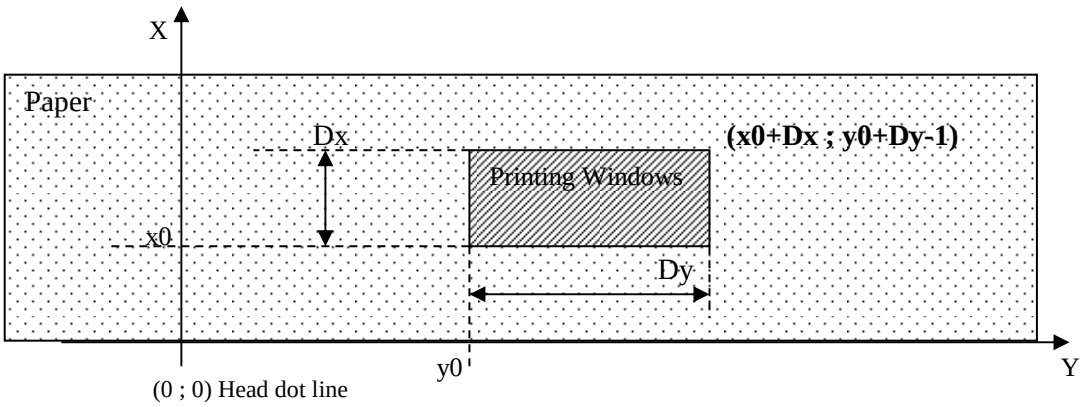
x0 = [(xL + xH x 256) x (horizontal direction of the fundamental calculation pitch)]

y0 = [(yL + yH x 256) x (vertical direction of the fundamental calculation pitch)]

Dx = [(dxL + dxH x 256) x (horizontal direction of the fundamental calculation pitch)]

Dy = [(dyL + dyH x 256) x (vertical direction of the fundamental calculation pitch)]

Keep the following notes in mind for this command. The fundamental calculation pitch depends on the vertical or horizontal direction. The maximum printable area in the x direction is 640 dots for 82.5 mm paper.



ESC Y n1 n2 d1 … dn - [MP]

1B 59 n1 n2 d1 … dn

Select Double Density Graphics

Synopsis: Select Double density graphics.

ASCII	ESC	Y	n1	n2	d1	…	dn
Hexadecimal	**1B**	**59**	**n1**	**n2**	**d1**	**…**	**dn**
Decimal	27	89	n1	n2	d1	…	dn

Value of n

(8-Dot Single Density Mode): *n*1 + (256 x *n*2)

(24-Dot Single Density Mode): 3 x [*n*1 + (256 x *n*2)]

Value of *d*: Number of Bytes of Data (Printed Down, Then Across)

Description: Enters one line of 8-dot double-density graphics into the print buffer. Any print command is required to print the line, after which the printer returns to normal processing mode. Double-density mode allows:

0-640 dot columns for 82.5mm paper.

0-576 dot columns for 80mm paper.

0-448 dot columns for 60mm paper.

The number of bytes sent is represented by the formulas in the table.

Each bit corresponds to one horizontal dot. Compare to Set Bit Image Mode (1B 2A, m=1) earlier in this document.

ESC [} - [MP]

1B 5B 7D

Switch to Flash Download Mode

Synopsis: Switch to flash download mode.

ASCII	ESC	[	}
Hexadecimal	**1B**	**5B**	**7D**
Decimal	27	91	125

Description: Puts the printer in flash download mode in preparation to receive commands controlling the downloading of objects into flash memory.

When this command is received, the printer leaves normal operation and can no longer print transactions until the Reboot the Printer command (1D FF) is received or the printer is rebooted.

This command does not affect the current communication parameters. Once the printer is in flash download mode, this command is no longer available.

Note: This command does not affect the current communication parameters.

Once the printer is in flash download mode, this command is no longer available.

ESC \ nL nH - [MP]

1B 5C nL nH

Set Relative Print Position

Synopsis: Set relative print position.

ASCII	ESC	\	nL	nH
Hexadecimal	**1B**	**5C**	**nL**	**nH**
Decimal	27	92	nL	nH

Value of *n:*

To Move the Relative Starting Position Right of the Current Position:

n = Number of dots to be moved right of the current position

nL = Remainder after dividing *n* by 256

nH = Integer after dividing *n* by 256

The values for *nL* and *nH* are two bytes in low byte, high byte word orientation.

To Move the Relative Starting-Position Left of the Current Position:

n = Number of dots to be moved left of the current position

nL = Remainder after dividing (65536-*n*) by 256

nH = Integer after dividing (65536-*n*) by 256

The values for *nL* and *nH* are two bytes in low byte, high byte word orientation.

Description: Moves the print-starting position the specified number of dots either right (up to the right margin) or left (up to the left margin) of the current position.

The print starting position is reset to the first column after each line.

Any setting that exceeds the printable area is ignored.

Note: If the Set Horizontal and Vertical Minimum Motion Units command (1D 50) is used to change the horizontal and vertical minimum motion unit, the parameters of this command (Set Relative Print Position) will be interpreted accordingly. For more information, see the description of the Set Horizontal and Vertical Minimum Motion Units command (1D 50) in this document.

Formulas: To move to the left:

The example shows how to set the relative position 20 dots to the left of the current position.

65536-20 = 65516 65516/256 = 255, remainder of 236 *nL* = 236, *nH* = 255

To move to the right:

The example shows how to set the relative position 260 dots to the right of the current position.

260/256 = 1, remainder of 4 *nL* = 04, *nH* = 01

ESC a n - [MP]
1B 61 n
Select Justification

Synopsis:	Select justification.		
ASCII	ESC	a	n
Hexadecimal	**1B**	**61**	**n**
Decimal	27	97	n

Operand: n = mode selection

Value of *n*
0, 48 = Left aligned
1, 49 = Center aligned
2, 50 = Right aligned

Limits : 0-2, 48-50

Default 0 (Left aligned)

Description: Specifies the alignment of characters, logos, and bar codes (see the value of *n*).

Exceptions: The command is valid only at the beginning of a line.

Example:

ABC ABCD ABCDE	ABC ABCD ABCDE	ABC ABCD ABCDE
n = 00	***n = 01***	***n = 02***

ESC c 5 n - [MP]
1B 63 35 n
Enable or Disable Panel Switch

Synopsis:	Enable or Disable Panel switch.			
ASCII	ESC	c	5	n
Hexadecimal	**1B**	**63**	**35**	**n**
Decimal	27	99	53	n

Value of *n*
0 = Enable
1 = Disable

Default 0 (Enable)

Description: Enables or disables the paper feed button by toggling the paper feed button on and off. Only the lowest bit is used to toggle the paper feed button. If the last bit is 0, the paper feed button is enabled. If the last bit is 1, the paper feed button is disabled.

Exceptions: Functions that require the panel button cannot be used when it has been disabled with this command.

ESC d n - [MP]]

1B 64 n

Print and Feed *n* Lines

Synopsis:	Print and feed n lines.		
ASCII	ESC	d	n
Hexadecimal	**1B**	**64**	**n**
Decimal	27	100	n

Operand: n = range

Limits : 0-255 (0 is interpreted as 1)

Description: Prints one line from the buffer and feeds paper n lines at the current line height.

ESC t n - [MP]

1B 74 n

Select Character Code Table or Active User-defined Font Selection

Synopsis:	Select character code table or active user-defined font selection		
ASCII	ESC	t	n
Hexadecimal	**1B**	**74**	**n**
Decimal	27	116	n

Operand: n = mode selection

Limits :

n		**Code Page**
Decimal	**Hex**	
0	00	437 : US
1	01	850 : Multilingual
2	02	852 : Latin 2, Slavic
3	03	860 : Portuguese
4	04	863 : Canadian French
5	05	865 : Nordic
6	06	858 : Multilingual Latin 1 + Euro
7	07	866 : Cyrillic, Russian
8	08	1252 : Windows, Latin 1
9	09	862 : Hebrew
10	0A	Katakana
11	0B	1253 : Windows, Greek
21	0C	737 : Greek
48	30	Easy Font Single Byte 0
49	31	Easy Font Single Byte 1
50	32	Easy Font Single Byte 2
51	33	Easy Font Single Byte 3

Default: 0 (Code Page 437), selectable through configuration menu

Description: Selects the character set to be used.

Notes: Set default Code Page 437, selectable through configuration menu with code 1F 03 80 n (= 0).
Same command (1B 52 n).

ESC v n - [MP]
1B 76
Transmit Paper Sensor Status

Synopsis: Transmit paper sensor Status.

ASCII	ESC	v
Hexadecimal	**1B**	**76**
Decimal	27	118

Description: Sends status data to the host computer. The printer sends one byte to the host computer when it is not busy or in a fault condition. See the following table.

Status Byte

Bit	Function	0 Signifies	1 Signifies
0	Receipt Paper	Present	Low (1)
1	Receipt Cover	Closed	Open (2)
1	Paper jam	No Jam	Jam (3)
2	Receipt Paper	Present	Out
3	Knife position	Home Position	Not Home Position
4	Not Used	Fixed to Zero	Fixed to Zero
5	Temperature	In valid range	Too hot or too cold
6	Voltage	In valid range	Too high or too low
7	Not Used	Fixed to Zero	Fixed to Zero

(1) Only if paper Low sensor mode is enabled.
(2) Only if Cover Mode is enabled..
(3) Only if paper jam mode is enabled

ESC z - [MP]
1B 7A
Clear Current Position Count

Synopsis: Clear current position count.

ASCII	ESC	z
Hexadecimal	**1B**	**7A**
Decimal	27	122

Description: A buffered command that clears the current position count.

ESC { n - [MP]
1B 7B n
Select or Cancel Upside-Down Print Mode

Synopsis:	Turn on/off upside down printing mode.		
ASCII	ESC	{	n
Hexadecimal	**1B**	**7B**	**n**
Decimal	27	123	n

Value of *n*
0 = Cancel
1 = Set

Default
0 (Cancel)

Description:
Prints upside-down characters. The command may be combined with Clock Wise Rotated print (1B 56) or Counter Clock Wise Rotated print (1B 12). The character order is inverted in the buffer so text is readable. Only bit 0 is used. Bits 1-7 are not used. See Summary of Rotated Printing in this document for more information.

FS F t - [MP]
1C 46 t
Read Font information

Synopsis:	Read font information.		
ASCII	FS	F	t
Hexadecimal	**1C**	**46**	**t**
Decimal	28	70	t

Operand: t = Font storage Identify

Value of t:

48	0x30 (ASCII *n* = 0)	Single Font n°00
49	0x31 (ASCII *n* = 1)	Single Font n°01
50	0x32 (ASCII *n* = 2)	Single Font n°02
51	0x33 (ASCII *n* = 3)	Single Font n°03

Returns:

OK	ACK (Hex = 06)	1 byte
	Font Id	1 byte
	Font Name	8 bytes
	Font width	1 byte
	Font Height	1 byte
	Number of characters	2 bytes < LSB , MSB>
	Checksum (Hex)	2 bytes < LSB , MSB>
Fault	NAK (Hex = 15)	1 Byte

Description:
If selected font exists, this command returns ACK followed by font information.
Else it returns NAK.

FS H - [MP]

1C 48

Check Easy Font compatibility

Synopsis:	Check Easy Font compatibility.	
ASCII	FS	H
Hexadecimal	**1C**	**48**
Decimal	28	72
Returns ASCII:	OK	ACK + list of available font Ids + 00
	Fault	NAK
Returns Hex:	OK	06 + list of available font Ids + 00
	Fault	15

Description: This command asks the printer whether it supports or not Font download.
If it does, it also returns the list of available font Ids (single byte, double byte) that can be used to download a font.

FS L f8 t w n {d} - [MP]
1C 4C f8 t w h *{ d }*
Download Single Byte Font

Synopsis: Download single byte printer font in User flash memory.

ASCII	FS	L	f8	t	*w*	*h*	{d}
Hexadecimal	**1C**	**4C**	***f8***	***t***	***w***	***h***	***{d}***
Decimal	28	76	*f8*	*t*	*w*	*h*	*{d}*

Operands:

f8	8 characters font name.
t	Font storage Id.
w	Font character width in dots, including inter-character space.
h	Font character height in dots, not including inter-line space.
d	Downloaded data bytes.

Limit Hex:

0x20 ≤ f8 ≤ 0x7F
0x30 ≤ t ≤ 0x33
0x01 ≤ w, h ≤ 0x20
0x00 ≤ d ≤ 0xFF

Returns :	**OK**	**Fault**
ASCII	ACK	NAK
Hexadecimal	**06**	**15**
Decimal	6	21

Description: This command will download a single byte font code page to the printer.

If the download is successful, an ACK will be returned.

If unsuccessful, a NAK will be returned. A font must always be downloaded completely, which corresponds to 224 characters.

The font name is used to identify the font. It will be printed on the diagnostics or configuration form. When a downloaded font is to be deleted, the font name is used to identify the font. Two fonts cannot have the same name. Each character is downloaded as raster, from top to bottom, and for each raster, from leftmost byte to rightmost byte. Two fonts cannot have the same storage Id.

Notes: See command select … (1Bh 74h n).

GS SOH - [BP] [MP]

1D 01

Request Flash Memory Size

Synopsis:	Request flash memory Size.	
ASCII	GS	SOH
Hexadecimal	**1D**	**01**
Decimal	29	1

Return : 1 bytes

Description: Returns the size of the flash used.

There may be 2 sectors (64K each) in flash memory.

This command assures that the firmware to be downloaded is the appropriate size for flash memory.

The returned value corresponds to the highest sector number that can be accepted by the Select Sector to Download (1D 02 nn) command :

1 = 128k bytes Flash

7 = 512k bytes Flash

15 = 1M byte Flash

GS STX n - [BP]

1D 02 n

Select Flash Memory Sector to Download

Synopsis:	Select flash memory sector to download.		
ASCII	GS	STX	n
Hexadecimal	**1D**	**02**	**n**
Decimal	29	2	n

Value and range	**n :**	0-07	= 512k bytes Flash
		0-11	= 768k bytes Flash
		0-15	= 1M bytes Flash

Description: Selects the flash sector (n) for which the next download operation applies.

The values of the possible sector are restricted, depending upon the flash part type. The printer transmits an ACK if the sector number is acceptable or an NAK if the sector number is not acceptable. Sector numbers start at 0.

Exceptions: Available only in download mode.

GS EOT n - [MP]

1D 03 n

Real Time Recovery from Fault

Synopsis:	Real time recovery from fault.		
ASCII	GS	EOT	n
Hexadecimal	**1D**	**03**	**n**
Decimal	29	3	n

Operand: n = Recovery mode

Description: See information command 10 05 n. Same command.

GS EOT n - [MP]

1D 04 n

Real Time Status Transmission

Synopsis:	Real time status transmission.		
ASCII	GS	EOT	n
Hexadecimal	**1D**	**04**	**n**
Decimal	29	4	n

Operand: n = Sequence

Description: See informations command (10 04 n). Same command.

GS ENQ - [MP]
1D 05
Real Time Status Transmission

Synopsis: Real time status transmission.

ASCII	GS	ENQ
Hexadecimal	**1D**	**05**
Decimal	29	5

Reply Status 1 byte (See value of byte table below)

Description: Transmits one byte status of the printer in real time.

Bit	Status	Hex	Decimal	Function
0	Off	00	0	Paper adequate.
	On	01	1	Paper Jam (if paper Jam Mode enabled).
1	Off	00	0	Paper adequate.
	On	02	2	Paper low (if paper low sensor enabled).
2	Off	00	0	Cover Closed.
	On	04	4	Cover Open.
3	Off	00	0	Not busy at the communication interface.
	On	08	8	Printer is busy at the communication interface.
4	On	10	16	Fixed to On.
5	Off	00	0	Fixed to Off.
6	Off	00	0	No error condition.
	On	40	64	Error condition exists in the printer.
7	On	80	128	Fixed to On.

GS ACK - [BP] [MP]
1D 06
Get Flash Firmware CRC Status

Synopsis: Get flash firmware Sector CRC.

ASCII	GS	ACK
Hexadecimal	**1D**	**06**
Decimal	29	6

Returns:	**OK**	**Fault**
ASCII	ACK	NAK
Hexadecimal	**06**	**15**
Decimal	6	21

Description: Causes the printer to calculate the CRC for the Flash firmware code space and transmits the result.

This is performed normally after downloading completely a new firmware to verify that the downloaded firmware is valid.

The printer transmits ACK if the calculated CRC is correct; NAK if the CRC is incorrect

GS BEL - [BP] [MP]
1D 07
Return Boot Sector CRC

Synopsis:	Return Boot Sector CRC.	
ASCII	GS	BEL
Hexadecimal	**1D**	**07**
Decimal	29	7
Returns:	3 byte	
Values:	ACK <low byte> <high byte>	
Description:	Returns the CRC calculated over the boot sector code space.	

GS BS -[MP]
1D 08
Return Static RAM Size

Synopsis:	Return static ram size.	
ASCII	GS	BS
Hexadecimal	**1D**	**08**
Decimal	29	8
Return:	1 byte =	SRAM sizes
Values (Dec):	(128Kb =) 4	
Description:	Returns the size of SRAM on board, on one byte as number of 32 Kbytes sectors.	

GS HT -[MP]
1D 09
Return CPU frequency

Synopsis:	Return CPU frequency.	
ASCII	GS	HT
Hexadecimal	**1D**	**09**
Decimal	29	9
Return:	1 byte =	Frequency
Values (Dec):	120 (MHz)	
Description:	Returns the CPU board frequency in MHz.	

GS LF n -[MP] [DBG]
1D 0A n
Return Hardware information

Synopsis: Return hardware monitoring.

ASCII	GS	LF	n
Hexadecimal	**1D**	**0A**	**n**
Decimal	29	10	n

Operand: n = Select reply status.

Limit: **Dec:** 00 ≤ n≤ 02
Hex: 00 ≤ n≤ 02

Returns <u>n = 00</u>: 1 bytes = Status Limit Byte reply

Value:

Bit(1)	Function	0 Signifies	1 Signifies
0	Temperature Low	No	Yes
1	Temperature High	No	Yes
2	Preheating	Finished	In Progress
3	Voltage Configuration	24V	12V
4	Reserved	Fixed to Zero	Fixed to Zero
5	Voltage Min	No	Yes
6	Voltage High	No	Yes
7	Reserved	Fixed to Zero	Fixed to Zero

Returns <u>n =01</u>: 1 bytes = Status Reset Byte reply

Value:

Bit(1)	Function	0 Signifies	1 Signifies
0	Reset CPU low power	No	Yes
1	Reset CPU watchdog	No	Yes
2	Reset CPU Software	No	Yes
3	Reset CPU hardware	No	Yes
4	Reserved	Fixed to Zero	Fixed to Zero
5	No used	-	-
6	Power Failure(2)	No	Yes
7	Reserved	Fixed to Zero	Fixed to Zero

Returns n =02: 1 bytes = Status Memory Byte reply

Value:

Bit(1)	Function	0 Signifies	1 Signifies
0	Last Write NVM	OK	Failure
1	Last Allocation Ram	OK	Failure
2	Last Allocation Flash	OK	Failure
3	No used	-	-
4	Reserved	Fixed to Zero	Fixed to Zero
5	No used	-	-
6	No used	-	-
7	Reserved	Fixed to Zero	Fixed to Zero

(1) Bits is not used default value "0".
(2) The printer reset bit will be zero after the reset condition has been reported to the host for the first time.

Description: Sends status data to the host computer.

GS VT -[MP]
1D 0B
Return User Flash Size

Synopsis: Return User flash memory size.

ASCII	GS	VT
Hexadecimal	**1D**	**0B**
Decimal	29	11

Return: 1 byte

Description: Returns the total amount of Flash memory accessible for user operations. This is the sum of memory allocated to Logos/fonts storage, User data storage, Easy font storage

Formulas: The User Flash Size is returned on one 1 byte, and the returned value corresponds the size divided by 65535 (64k).

For example, if the User Flash Size is 512kb, the command would return

8 as 512/64 = 8.

GS SO -[BP]

1D 0E

Erase All Flash Contents except Boot Sector

Synopsis:	Erase all flash contents except boot sector.	
ASCII	GS	SO
Hexadecimal	**1D**	**0E**
Decimal	29	14

Return value :	**OK**	**Fault**
ASCII	ACK	NAK
Hexadecimal	**06**	**15**
Decimal	6	21

Description: Causes the entire flash memory to be erased.
The printer returns ACK if the command is successful; NAK if it is unsuccessful.

Note: Available only in download mode.

GS SI - [BP] [MP]

1D 0F

Return Main Program Flash CRC

Synopsis:	Return main program flash CRC.		
ASCII	GS	SI	
Hexadecimal	**1D**	**0F**	
Decimal	29	15	
Returns:	3 bytes		
Values:	ACK	<low byte>	<high byte>

Note: Returns the CRC calculated over the flash firmware code space.

GS DLE n - [BP]

1D 10 n

Erase Selected Flash Sector

Synopsis: Erase selected flash sector.

ASCII	GS	DLE	n
Hexadecimal	**1D**	**10**	**n**
Decimal	29	16	n

Value and range

n :

0-7	= 512k bytes Flash
0-12	= 768k bytes Flash
0-15	= 1M bytes Flash

Note: Erases the previously selected sector. The printer transmits ACK when the sector has been erased. If the previous sector is not successfully erased, or if no sector was selected, the printer transmits NAK.

Exceptions: Available only in download mode.

GS DC1 al ah cl ch d1…dn -[BP]

1D 11 al ah cl ch d1…dn

Download to Active Flash Sector

Synopsis: Download to active flash sector.

ASCII	GS	DC1	al	ah	cl	ch	d1…dn
Hexadecimal	**1D**	**11**	**al**	**ah**	**cl**	**ch**	**d1…dn**
Decimal	29	17	al	ah	cl	ch	d1…dn

Value of :

al	= Low byte of address.
ah	= High byte of address.
cl	= Low byte of the count.
ch	= high byte of the count.
d	= Data bytes , from 1 to n.

Formulas: Address start = ((ah* 256) + al)

Count = n = ((ch * 256) + cl)

Limits: Address start + Count ≤ 10000 (Hex)

n number of data bytes	Range of address (al ah)	Range of Count (cl ch)
((ch * 256) + cl)	0000 - FFFF (Hex)	0001 - FFFF (Hex)

Description: Contains a start address (ah x 256 + al) and count (ch x 256 + cl) of binary bytes to load into the selected sector, followed by that many bytes. The start address is relative to the start of the sector. Addresses run from 0 to xxK.

The printer may return one of several responses. ACK means that the data was written correctly and the host should transmit the next block. NAK means that, for some reason, the data was not written correctly. This could mean that communications failed or that the write to flash failed. The alternatives seem to be to retry the block or halt loading and assume a hardware failure.

Notes: Number data byte must be modulo 4kbytes. Available only in download mode.

GS ! n - [MP]

1D 21 n

Select Char Size

Synopsis:	Select character size.		
ASCII	GS	!	n
Hexadecimal	**1D**	**21**	**n**
Decimal	29	33	n

Value of *n* 1-8 = vertical number of times normal font.
1-8 = horizontal number of times normal font.

Range of *n* 00-07, 10-17, …, 70-77 (bits 0,1,2;4,5,6)

Default 00

Description: This command is effective for all characters (except for HRI characters).

In standard mode (non page mode), the vertical direction is the paper feed direction, and the horizontal direction is perpendicular to the paper feed direction. However, when character orientation changes in 90 degree clockwise-rotation mode, the relationship between vertical and horizontal directions is reversed.

Selects height using bits 0 to 2 and selects the character width using bits 4 to 6, as tables follows:

Exception: If n is out of the defined range, this command is ignored.

Character Width Selection bits 4,5,6		
Hex	**Decimal**	**Width**
00	0	1 (normal)
10	16	2 (two times width)
20	32	3 (three times width)
30	48	4 (four times width)
40	64	5 (five times width)
50	80	6 (six times width)
60	96	7 (seven times width)
70	112	8 (eight times width)

Character Height Selection bits 0,1,2		
Hex	**Decimal**	**Height**
00	0	1 (normal)
01	1	2 (two times height)
02	2	3 (three times height
03	3	4 (four times height)
04	4	5 (five times height)
05	5	6 (six times height)
06	6	7 (seven times height)
07	7	8 (eight times height)

GS “ n - [MP]

1D 22 n

Select Memory Type (SRAM/FLASH) Where to save Logos or User-defined Fonts

Synopsis: Select Memory type SRAM or Flash.

ASCII	GS	“	n
Hexadecimal	**1D**	**22**	**n**
Decimal	29	34	n

Value of n 48-51

= 48 (ASCII *n* = 0)	Loads active logo to RAM only. This is used to print a special logo but not have it take up flash memory. A logo defined following this command is not preserved over a power cycle.
= 49 (ASCII *n* = 1)	Loads active logo to flash memory. This is the default condition for logo flash storage. A logo defined following this command is stored in flash memory.
= 50 (ASCII *n* = 2)	Loads user-defined characters to RAM only. This is the default condition for user-defined character storage. Any user-defined characters defined following this command are not preserved over a power cycle
= 51 (ASCII *n* = 3)	Loads user-defined characters to flash memory. An application must use this command to store user-defined characters in flash memory. Any user-defined characters defined following this command are stored in flash memory. A user-defined character cannot be redefined in flash memory. The flash memory page must be erased by an application before redefining user-defined characters. For more information, see the Erase User Flash Sector (1D 40 *n*) Command earlier in this section.

Description: Specifies whether to load the logos or user-defined characters to flash memory or to RAM (volatile memory). The selection remains in effect until it is changed via this command or until the power cycles.

GS " U n - [MP]
1D 22 55 n1 n2
Flash Memory User Sector Allocation

Synopsis: This command sets the allocation of flash sectors between user data storage, logos/user defined characters and EasyFont. This allocation is saved in the EEPROM of the printer and is therefore saved across power cycles..

ASCII	GS	"	U	n1	n2
Hexadecimal	**1D**	**22**	**55**	**n1**	**n2**
Decimal	29	34	85	n1	n2

Default value of n1 : 1 (n1 See Below)
Default value of n2 : 2 (n2 See Below)

Formulas:
n1 + n2 ≤ 3 (= Size Max Storage for 512Kb flash memory)
n1 + n2 ≤ 7 (= Size Max Storage for 768Kb flash memory)
n1 + n2 ≤ 11(= Size Max Storage for 1Mb flash memory)
Size Max. Storage = n1 + n2 + n3
n3 = Size Max. Storage – n1 – n2

Return :	**OK**	**Fault**
ASCII	ACK	NAK
Hexadecimal	**06**	**15**
Decimal	6	21

Description: n1 is the number of 64K sectors used for logos and user defined characters.
n2 is the number of 64K sectors used for user data storage.
n3 is the number of 64K sector used for Easy font storage.
For this project we have a restriction see tables below!!!

Note:
If If (n1 + n2) =0, all sector are used for Easy font sector.
If (n1 + n2) is greater than the maximum number of sectors available, the command is ignored.
Issuing this command with parameters different from current parameters will erase all sectors.
See also Command "Return User Flash Size" (1D 0B) to retrieve User Flash Size from printer.
If specific sector 64k is locked (see command 1D 22 64 *n*), the command is ignored and reply NAK.

Size Max. storage	Number Sector(s)	
Flash Memory	64Kb	128Kb
512K	1	1
768K	1	3
1024K	1	5

Example: All configurations for 512Kb flash memory:

n1	n2	n3	Logo/Fonts (Kb)	User data (Kb)	EasyFonts (Kb)
1	0	2	64	0	128
1	2	0	64	128	0
2	1	0	128	64	0
2	0	1	128	0	64
0	1	2	0	64	128
0	2	1	0	128	64

GS " d n - [MP]
1D 22 64 n
Lock a specific sector 64Kb in User Flash Memory Allocation

Synopsis: Select lock or unlock 64Kb user sector allocation and save information in NVM.

ASCII	GS	"	D	n
Hexadecimal	**1D**	**22**	**64**	**n**
Decimal	29	34	100	n

Operand: n = mode selection

Range of n: 00 – 01

n = 00 sector Unlock (default).

n = 01 sector locked or permanent memory set.

Description: This command will store the *locked type* selection in non-volatile memory.

If sector locked. When you download a new program or with the command (1D 0E *n*) for erase all sectors except Boot. The 64Kb sector is preserved.

If you use the command erase specific sector (1D 40 *n*), with *n* is the position of 64Kb sector and locked, the sector isn't erased.

If you use the command flash memory allocation (1D 22 55 *n m*), if sector locked, the command are ignored, and reply (0x15).

Note: This command must be followed by a reset.

See also command status flag reply (1D 22 65).

GS " e - [MP]
1D 22 65
Reply Status flag Lock for specific sector 64Kb

Synopsis: Return status flag lock or unlock 64Kb user sector.

ASCII	GS	"	e
Hexadecimal	**1D**	**22**	**65**
Decimal	29	34	101

Reply range: 00 – 01

00 = sector Unlock (default).

01 = sector locked or permanent memory set.

Note: See command (1D 22 64 *n*) for more information.

GS # n -[MP]
1D 23 n
Select the Current Logo

Synopsis: Select the current Logo.

ASCII	GS	#	*n*
Hexadecimal	**1D**	**23**	**n**
Decimal	29	35	*n*

Operand: n = mode selection

Range of n: 0 – 255

Default value : n= 00

Description: Selects a logo to be defined or printed. The active logo n remains in use until this command is sent again with a different logo n, or command 1B40 is sent or printer reboots.

When this command precedes a logo definition, that definition, is stored in Flash or RAM memory as logo *n*. If the logo is saved to flash (see command 1D 22 n), if there is already a different definition in flash memory for logo *n*, the first is inactivated and the new definition is used. The inactive definition is not erased from flash and continues to take up space in flash memory.

When this command precedes a logo print command and *n* is different from the previously active logo selected, the printer retrieves the logo definition for *n* from memory and prints it. If there is no definition for logo *n*, then no logo is printed.

In the case of a previously existing application that expects only one possible logo, the printer will not receive the Select Current Logo (1D 23 *n*) command. In this case, the printer assigns 0 as the active logo identifier. It automatically stores any new logo definition in memory as logo 0, inactivating any previous logo 0 definitions. If the flash memory space available for logos fills up with inactive logo 0 definitions, the firmware erases the old definitions at the next power cycle. This is the only case in which the printer erases flash memory without an application command.

Note: In the case of a new application using multiple logos, the Select Current Logo (1D 23 *n*) command is used. After that, the printer no longer automatically erases the logo definition flash memory page when it fills with multiple definitions. A new application using multiple logos, writing a user-defined character set into flash memory, or both, is responsible for erasing the logo and user-defined character set flash memory page

when the logo area is full or before a new character set is defined.

GS $ nL nH -[MP]
1D 24 nL nH
Set Absolute Vertical Print Position in Page Mode

Synopsis: Set absolute vertical print in page mode.

ASCII	GS	$	*nL*	*nH*
Hexadecimal	**1D**	**24**	**nL**	**nH**
Decimal	29	36	*nL*	*nH*

Formulas [(*nL* + *nH* X 256) x (vertical or horizontal motion unit)] inches.

Description: Sets the absolute vertical print starting position for buffer character data in page mode. The absolute print position is set to [(*nL* + *nH* X 256) x (vertical or horizontal motion unit)] inches.

The vertical or horizontal motion unit for the paper roll is used and the horizontal starting buffer position does not move.

The references starting position is set by Select Print Direction in Page Mode (ESC T) and operates setting the absolute position in the vertical direction when the starting position is set to the upper left or lower right; and sets the absolute position in the horizontal when the starting position is set to the upper rights or lower left.

The horizontal and vertical motion units are specified by the Set Horizontal and Vertical Minimum Motion Units (GS P) command.

The Set Horizontal and Vertical Minimum Motion Units (GS P) command can be used to change the horizontal and vertical motion unit. However, the value cannot be less than the minimum horizontal movement amount, and it must be in even units of the minimum horizontal movement amount.

Note: This command is effective only in page mode.

If the [(*nL* + *nH* X 256) x (vertical or horizontal motion unit)] exceeds the specified printing area, this command is ignored.

GS % s dL dH – [MP]

1D 25 s dL dH

Select or Cancel Multi-Heat Current Mode

Synopsis: Change Multi-Heat Current Mode.

ASCII	GS	%	*n*	*dL*	*dH*
Hexadecimal	**1D**	**25**	**n**	**dL**	**dH**
Decimal	29	37	*n*	*dL*	*dH*

Operand:

n = Select Multi-Heat Mode

0 0x00 = Reset Multi-Heat Mode

1 0x01 = Set Multi-Heat Mode

dH = Msb number dots (1 byte).

dL = Lsb number dots (1 byte).

Number dots = (dL + (dH * 256))

Description: This command allows the user to set or reset the multi-heat current process and to configure the peak current with the number of dots on in same time.

If line buffer isn't empty, prints one line from the buffer and change multi-Heat mode or parameters.

Formulas: Current Head (A) = ((Vch/Rhdot)*Number dots)

- Vch = Head Power Supply 24.0V - Rdot nominal = 700Ohm nominal. - Number Dots = [32; 640].
- Vch = Head Power Supply 12.0V - Rdot nominal = 300Ohm nominal. - Number Dots = [32; 640].

Example: Rdot = 700Ohm ; Vch = 24.0V ; Number dots = 112 ➔ Peak current Head = 3.84A

Rdot = 300Ohm ; Vch = 12.0V ; Number dots = 224 ➔ Peak current Head = 8.96A

Note : After reset, the Multi-Heat Mode is 0 or 1.This value depend of the the command (1F 03 A5 s dL dH).

GS * n1 n2 d1…dn - [MP]
1D 2A n1 n2 d1 ... dn
Define Downloaded Bit Image

Synopsis: Define downloaded bit image in memory.

ASCII	GS	*	*n1*	*n2*	*d1…dn*
Hexadecimal	**1D**	**2A**	**n1**	**n2**	**d1…dn**
Decimal	29	42	*n1*	*n2*	*d1…dn*

Operands:

Value of *n*1	**Value of *n*2**	**Value of *d***
1-56 (8 x *n*1 = Number of Horizontal Dot Columns)	1-64 (Number of Vertical Bytes)[1]	Bytes of Data (Printed Down, Then Across)

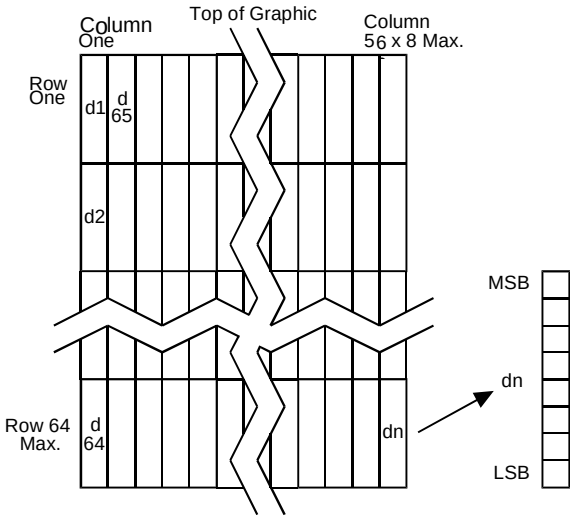
[1]The number of bytes sent is represented by the following formula:
n = 8 x *n*1 x *n*2 (*n*1 x *n*2 must be less than or equal to 3584).
See the illustration below for a graphic representation of the downloaded bit image :

Return :	**OK**	**Fault**
ASCII	ACK	NAK
Hexadecimal	**06**	**15**
Decimal	6	21

Description: Enters a downloaded bit image (such as a logo) into RAM or Flash with the number of dots specified by n1 and n2. The downloaded bit image is available until power is turned off, another bit image is defined, or either Initialize Printer (1B 40), command is received.

Note: See the illustration below for a graphic representation of the downloaded bit image.
See also chapter “Memory allocation” for information about potential limitations.

Ex 60 mm paper 448 dots = 56 bytes



Dn = 56 Data bytes if 448 dots (60mm paper width),
72 Data bytes if 576 dots (80mm paper width)
80 Data bytes if 640 dots (82.5mm paper width)

GS / m - [MP]

1D 2F m

Print Downloaded Bit Image

Synopsis: Print downloaded bit image (Logo).

ASCII	GS	/	*m*
Hexadecimal	**1D**	**2F**	**m**
Decimal	29	47	*m*

Operand: m = mode selection:

Value of *m*	Print Mode	Vertical DPI[1]	Horizontal DPI*
0	Normal	203	203
1	Double Wide	203	101
2	Double High	101	203
3	Quadruple	101	101

[1]Dot density measured in dots per inch

Description: Prints the downloaded bit image at a density specified by m. It is ignored if any data is in the print buffer, if the downloaded bit image is undefined.

Note: See the illustration on the previous page for a representation of the bit image (1D 2A).

GS : - [MP]

1D 3A

Select or Cancel Macro Definition

Synopsis: Start / End macro definition.

ASCII	GS	:
Hexadecimal	**1D**	**3A**
Decimal	29	58

Description: Starts or ends macro definition. Macro definition begins when this command is received during normal operation and ends when this command is received during macro definition. The macro definition is cleared, during definition of the macro when the Execute Macro (GS ^) command is received.

Normal printing occurs while the macro is defined. When the power is turned on the macro is not defined.

The defined contents of the macro are not cleared by the Initialize Printer (ESC @), thus, the Initialize Printer (ESC @) command may be used as part of the macro definition.

If the printer receives a second Select or Cancel Macro Definition (GS :) command immediately after previously receiving a Select or Cancel Macro Definition (GS :) the printer remains in the macro undefined state.

Formulas: The contents of the macro can be defined up to 2048 bytes.

Exception: If the macro definition exceeds 2048 bytes, excess data is not stored.

GS @ n - [MP]

1D 40 n

Erase Sections of User Flash Sector

Synopsis:	Erase sections of user flash sector.		
ASCII	GS	@	*n*
Hexadecimal	**1D**	**40**	**n**
Decimal	29	64	*n*

Operand: n **= mode selection:**

Value of *n*:

49 *n* = 49 (ASCII *n* = 1 ; Hexadecimal n = 31)

This command erases all 64K Flash memory sectors allocated to user-defined characters and logos storage. Those sectors should be erased in two situations: when the logo definition areas is full and an application is attempting to define new logos, and when an application wants to replace one user-defined character set with another. In both cases, all logos and character set definitions are erased and must be redefined.

50 *n* = 50 (ASCII *n* = 2 ; Hexadecimal n = 32)

This command erases all 64K Flash memory sectors allocated to user data storage.

51 *n* = 51 (ASCII *n* = 3 ; Hexadecimal n = 33)

This command erases all 64K Flash memory sectors allocated to Easy Font storage.

Returns :	**= Operation completed**	**= Operation ignored**
ASCII	CR	NAK
Hexadecimal	0D	15
Decimal	13	21

Description: Erases a section of user flash memory and sends a carriage return when the operation is complete.

Note: See command “Flash Memory User Sectors Allocation (1D 22 55 n1 n2).

If you use the command erase specific sector (1D 40 *n*), with *n* is the position of 64Kb specific sector and 64Kb sector is locked (see 1D 22 64 *n* and 1D 22 65), the sector isn’t erased. Reply Operation ignored (=NAK).

Important: While erasing flash memory, all communication is disabled. To provide feedback to the application, the printer responds to the application when the erase is complete. After sending the Erase User Flash Sector (1D 40 n) command, an application should wait for the response from the printer before sending data. Otherwise, data will be lost. If an application is unable to receive data, it should wait a minimum of five seconds after sending the Erase User Flash Sector (1D 40 n) command before sending data.

GS B n - [MP]

1D 42 n

Select or Cancel White/Black Reverse Print Mode

Synopsis:	Select or cancel white/black reverse print mode.		
ASCII	GS	B	*n*
Hexadecimal	**1D**	**42**	**n**
Decimal	29	66	*n*

Operand:	n	= mode selection:
Value of *n*	0	Off
	1	On
Default	0 (Off)	

Description: In White/Black reverse printing mode, print dots and non-print dots are reversed, which means that white characters are printed on a black background.

When the White/Black reverse printing mode is selected it is also applied to character spacing which is set by Right-Side Character Spacing (ESC SP).

This command can be used with built-in characters and user-defined characters, but does not affect the space between lines.

White/Black Reverse Print Mode does not affect graphics, logos, bar code, HRI characters, and spacing skipped by Horizontal Tab (HT), Set Absolute Starting Position (ESC $), and Set Relative Print Position (ESC \).

Exceptions: Only the lowest bit of n is valid.

GS H n - [MP]

1D 48 n

Select Printing Position of HRI Characters

Synopsis:	Select printing position for HRI characters. Barcode Text Mode		
ASCII	GS	H	*n*
Hexadecimal	**1D**	**48**	**n**
Decimal	29	72	*n*

Operand:	**n**	**= Printing position**
	0	= Not printed
	1	= Above the bar code
	2	= Below the bar code
	3	= Both above and below the bar code
Default:	0	

Description: Prints HRI (Human Readable Interface) characters above or below the bar code.

GS I n - [MP]

1D 49 n

Transmit Printer ID

Synopsis:	Transmit printer Identify		
ASCII	GS	I	*n*
Hexadecimal	**1D**	**49**	**n**
Decimal	29	73	*n*

Operand: **n** **= Printer ID select**

Limit decimal: $1 \le n \le 2$; $49 \le n \le 50$; n = 66,67,68

Limit hex: $01 \le n \le 02$; $31 \le n \le 32$; n = 42,43,44

Description: Transmits the printer model, type of version as defined below.
This command is processed as normal printer data.

Note: For n = 66, 67, 68 the printer response is sent back in the following format:

Header: 5F (hex)

Data: ASCII string

NULL: 00 (hex)

"GS I" OPERAND AND RETURNED STATUS DEFINITION

n		Printer ID	Function		Value	
Decimal	**Hex**				**Decimal**	**Hex**
1, 49	01, 31	Model	TRITON80 / TRITON80		69	45
2, 50	02, 32	Type	Bit	Function	Value	
					0	1
			0	2-byte character code	Not installed	Installed
			1	Knife	No knife	Installed
			2	Paper Jam System	Not installed	Installed
			3	Paper Low System	Not installed	Installed
			4	Fixed	Always 0	-
			5	Presenter system	Not installed	Installed
			6	Undefined	-	-
			7	Fixed	Always 0	-
66	42	Manufacturer	_AXIOHM			
67	43	Printer name	_TRITON80/ _TRITON80			
68	44	Serial number	Depends on actual S/N			

GS I @ n - [MP]

1D 49 40 n

Transmit Printer ID, Remote Diagnostics Extension

Synopsis: Performs the remote diagnostic functions specified by *n.*

ASCII	GS	I	@	*n*
Hexadecimal	**1D**	**49**	**40**	**n**
Decimal	29	73	*64*	*n*

Operand: **n** mode selection

Values of n: Refer to table below

Return format: n + data +<CR>

Description: Performs functions specified by *n (Refer to table).*

Exceptions: If any digit is out of the defined range, Write to NVM is ignored.

Value of *n*		**Remote diagnostic item**		**Function**
Hex	**Dec**			
20	32	Serial #, 10 digits ASCII	**(*)**	Write to NVRAM Example, send 14 bytes to printer: GS I @ 0x20 1234567890
21	33	Serial #		Write to NVRAM, and print on receipt to verify Example, send 14 bytes to printer: GS I @ ! 1234567890 This will print on receipt: Serial # written: 1234567890
23	35	Serial #		Return Serial #, preceded by *n* to identify Printer returns 12 bytes in above example: #1234567890<CR>
				(*) 0x20 ≤ digit ≤ 0x79
24	36	Class/model #, 15 digits ASCII	**(*)**	Write to NVRAM
25	37	Class/model #		Write to NVRAM, and print on receipt to verify
27	39	Class/model #		Return Class/model #, returns 17 bytes
2B	43	Boot firmware part Number		Return boot firmware part number, return 14 bytes
2F	47	Boot firmware CRC, 4 digits ASCII		Return Boot firmware CRC, returns 6 bytes
33	51	Client firmware part number		Return client firmware part number, returns 14 bytes
37	55	Client firmware CRC, 4 digits ASCII		Return Client firmware CRC, returns 6 bytes

Value of *n*		Remote diagnostic item	Function
Hex	**Dec**		
80	128	Receipt lines tally, 8 digits ASCII numeric, max 99,999,999	Write to NVRAM Example, send 12 bytes to printer: GS I @ Ç00010000 To set receipt lines tally to 10,000
81	129	Receipt lines tally	Write to NVRAM, and print on receipt to verify Example, send 12 bytes to printer: GS I @ ü00010000 This will print on receipt: Receipt tally written: 10,000
82	130	Receipt lines tally	Clear receipt lines tally to 0
83	131	Receipt lines tally	Return receipt lines tally, preceded by *n* to identify Printer returns 10 bytes in above example: â00010000<CR>
90	144	Hours on tally, 8 digits ASCII numeric, max 99,999,999	Write to NVRAM
91	145	Hours on tally	Write to NVRAM, and print on receipt to verify
92	146	Hours on tally	Clear Hours on tally to 0
93	147	Hours on tally	Return Hours on tally, returns 10 bytes
97	151	Boot firmware version	Return Boot firmware version, returns 6 bytes
A3	163	Flash firmware version	Return Flash firmware version, returns 6 bytes
A4	164	Flash cycles tally, 8 digits ASCII numeric, max 99,999,999	Write to NVRAM
A5	165	Flash cycles tally	Write to NVRAM, and print on receipt to verify
A6	166	Flash cycles tally	Clear Flash cycles tally to 0
A7	167	Flash cycles tally	Return Flash cycles tally, returns 10 bytes
AC	172	Cover Open 8 digits ASCII numeric, max 99,999,999	Write to NVRAM Example, send 12 bytes to printer: GS I @ ¼00010000 To set Cover Open tally to 10,000
AD	173	Cover Open	Write to NVRAM, and print on receipt to verify Example, send 12 bytes to printer: GS I @ ¡0010000 This will print on receipt: Cover Open: 10,000
AE	174	Cover Open	Clear Cover Open tally to 0.
AF	175	Cover Open	Return Cover Open tally, preceded by *n* to identify Printer returns 10 bytes in above example: »0010000<CR>
B2	178	MAX Temperature tally	Set MAX temp tally to -273.
B3	179	MAX Temperature tally	Return Temperature tally

Value of *n*		Remote diagnostic item	Function
Hex	**Dec**		
B4	180	Reboot device tally, 8 digit ASCII numeric, max 99,999,999	Write to NVRAM.
B5	181	Reboot device tally	Write to NVRAM, and print on receipt to verify.
B6	182	Reboot device tally	Clear Flash cycles cut tally to 0.
B7	183	Reboot device tally	Return reboot device tally, return 10 bytes.
D8	216	Meter Print tally, 8 digits ASCII numeric, max 99,999,999	Write to NVRAM.
D9	217	Meter Print tally	Write to NVRAM, and print on receipt to verify.
DA	218	Meter Print tally	Clear Flash Meter Print tally to 0.
DB	219	Meter Print tally	Return Meter Print tally, return 10 bytes.
E4	228	Taken Ticket counter, 8 digits ASCII numeric, Default 0, max 99,999,999	Write to NVRAM, Example, send 12 bytes to printer: GS I @ õ00010000 To set Taken Ticket counter tally to 10,000
E5	229	Taken Ticket counter tally	Write to NVRAM, and print on receipt to verify Example, send 12 bytes to printer: GS I @ Õ00010000 This will print on receipt: Taken Ticket counter tally written: 10,000
E6	230	Taken Ticket counter tally	Clear Taken Ticket counter tally to 0
E7	231	Taken Ticket counter tally	Return Taken Ticket counter, preceded by *n* to identify Printer returns 10 bytes in above example: þ00010000<CR>
E8	232	Retract Ticket counter tally, 8 digit ASCII numeric, Default 0, max 99,999,999	Write to NVRAM
E9	233	Retract Ticket counter tally	Write to NVRAM, and print on receipt to verify
EA	234	Retract Ticket counter tally	Clear Retract Ticket counter tally to 0
EB	235	Retract Ticket counter tally	Return Retract Ticket counter tally, returns 10 bytes

GS L nL nH - [MP]
1D 4C nL nH
Set Left Margin

Synopsis:	Set left margin.			
ASCII	GS	L	*nL*	*nH*
Hexadecimal	**1D**	**4C**	**nL**	**nH**
Decimal	29	76	*nL*	*nH*

Operand: n = ((**nH** * 256) + **nL**)

Limits: Printable area size.

Range of nL 0-255

Range of nH 0-255

Default 640 dots (MGTA)

Description: Sets the left margin of the printing area. The left margin is set to (((nH X 256) + nL) times horizontal motion unit) inches. The horizontal motion units are set by the Set Horizontal and Vertical Minimum Motion Units command (1D 50). This command is described below.

The width of the printing area is set by the Set Printing Area Width command (1D 57), which follows this command. See the Set Printing Area Width command (1D 57) in this document for a description of that command.

If the setting exceeds the printable area, the maximum value of the printable area is used. The maximum printable area is 640 dots. See the illustration.

Note: If the setting exceeds the printable area, the maximum value of the printable area is used (n=0).

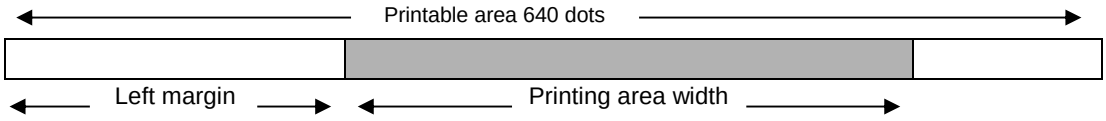
The maximum printable area is 640 dots. See the illustration.

The command is ignored if it is not at the beginning of the line.

Formulas: To set the left margin to one inch, send the four-byte string: GS L 203 0

Or, to set the left margin to two inches, send the four-byte string: GS L 150 1

Where 2 inches = 406/203, and 406 = (1 X 256) + 150.



GS P x y - [MP]

1D 50 x y

Set Horizontal and Vertical Minimum Motion Units

Synopsis:	Set Motion Units.			
ASCII	GS	P	*nL*	*nH*
Hexadecimal	**1D**	**4C**	**nL**	**nH**
Decimal	29	76	*nL*	*nH*

Value of x: Horizontal.

Value of y: Vertical.

Range of x: 0-255

Range of y: 0-255

Default of x: 203

Default of y: 203

Description: Sets the horizontal and vertical motion units to 1/x inch and 1/y inch respectively.
When x or y is set to 0, the default setting for that motion unit is used.

GS V m / GS V m n / GS V m n l – [MP]

1D 56 m

1D 56 m n

1D 56 m n l

Set Cut Mode and Cut Paper

Synopsis:	Select a mode for cutting paper and cuts the paper.												
ASCII	GS	V	*m*		GS	V	*m*	*n*		GS	V	*m*	*n*	*l*
Hexadecimal	**1D**	**56**	**m**		**1D**	**56**	**m**	**n**		**1D**	**56**	**m**	**n**	**l**
Decimal	29	86	*m*		29	86	*m*	*n*		29	86	*m*	*n*	*l*

Value of m: Selects the mode as shown in the table below.

Value of n, l: Determine cutting position.

Operand m: = Cut mode.

Operand n, l: = Additional distance to feed prior to cut beyond the cut position or after.

Limits:	Option1:	Option2:	Option3:
Dec:	0≤ *m* ≤ 5 ; 48 ≤ *n* ≤ 53	65 ≤ *m* ≤ 66 ; 0 ≤ *n* ≤ 255	6 ≤*m*≤ 7 ; 0 ≤*n, l*≤ 255 ;
Hex:	00≤ *m* ≤ 05 ; 30≤ *n* ≤ 35	41 ≤ *m* ≤ 42 ; 00 ≤ *n* ≤ FF	06 ≤ *m*≤ 07; 00≤*n, l* ≤ FF

Description: There are tree formats for this command , one requiring one parameter m, another requiring two parameters m and n, and other requiring tree parameters m, n and l.
The format is indicated by the parameter m.

"GS V" OPERAND DEFINITION		
m		**Cut Mode**
Decimal	**Hex**	
0, 48	00, 30	Full cut.
1, 49	01, 31	Partial cut.
2, 50	02, 32	Executes a full cut then reverse feed so top of ticket is at the print line.
3, 51	03, 33	Executes a partial cut then reverse feed so top of ticket is at the print line.
4, 52	04, 34	Feeds paper to cut position, executes a full cut, then reverse feed so top of ticket is at the print line.
5, 53	05, 35	Feeds paper to cut position, executes a partial cut, then reverse feed so top of ticket is at the print line.
65	41	Feeds paper *n* x vertical motion units beyond the cut position then executes a full cut.
66	42	Feeds paper *n* x vertical motion units beyond the cut position then executes a partial cut.
6	06	Feeds paper n sublines, executes a full cut and then reverse feed l sublines.
7	07	Feeds paper n sublines, executes a partial cut and then reverse feed l sublines.

Note: (1) Partial cuts selection will replace with full cuts when a presenter is installed.

(2) Reverse Feed is not performed immediately after cutting the paper, but instead before the next print or paper feed operation, to prevent the edge of the paper from sticking to the roller, as this could potentially generate paper jam.

(3)The reverse feed is accomplished at low speed to prevent the clamshell mechanism from opening by itself.

The reverse feed distance is fixed.

(4) Get a minimal distance of 2 mm on the top and end of ticket to prevent paper jam (Mechanical tolerance , paper thickness, temperature, …)

GS W nL nH - [MP]

1D 57 nL nH

Set Printing Area Width

Synopsis:	Set printing area width.			
ASCII	GS	W	*nL*	*nH*
Hexadecimal	**1D**	**57**	**nL**	**nH**
Decimal	29	87	*nL*	*nH*

Operand: **n** = ((nH * 256) + nL) dots

Range of nL 0-255

Range of nH 0-255

Default : 640 dots (the maximum printable area) for 82.5mm paper.

Description: Sets the width of the printing area. If the setting exceeds the printable area, the maximum value of the printable area is used. The width of the printing area is set to (((*nH* X 256) + *nL*) times horizontal motion unit) inches. The horizontal motion units are set by the Set Horizontal and Vertical Minimum Motion Units command (1D 50), which is described earlier in this document.

The width of the printing area follows the Set Left Margin command (1D 4C). See the Set Left Margin command (GS L) earlier in this document for a description.

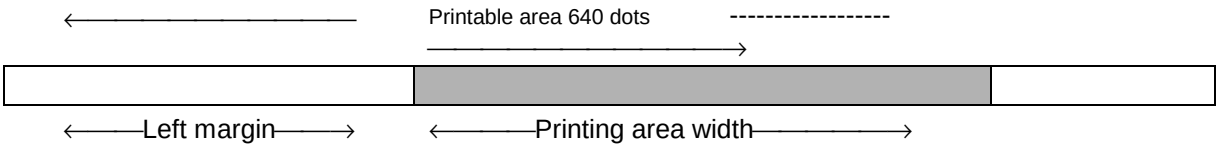
Notes: The command is ignored if it is not at the beginning of the line.

If the setting exceeds the printable area, the maximum value of the printable area is used.

Formulas: To set the width of the printing area to one inch, send the four-byte string: GS W 203 0

Or, to set the width of the printing area to two inches, send the four-byte string: GS W 150 1

Where 2 inches = 406/203, and 406 = (1 X 256) + 150.



GS \ nL nH - [MP]

1D 5C nL nH

Set Relative Vertical Print Position in Page Mode

Synopsis:	Set relative vertical print position in page mode.			
ASCII	GS	\	*nL*	*nH*
Hexadecimal	**1D**	**5C**	**nL**	**nH**
Decimal	29	92	*nL*	*nH*

Value: **The value for the horizontal and vertical movement cannot be less than the minimum horizontal movement amount, and, must be in even units of the minimum horizontal movement amount.**

Formulas: The distance from the current position is set to [(*nL* + *nH* x 256) x vertical or horizontal motion unit] inches.

For downward movement, pitch n is specified as :

n = *nL* + *nH* x 256

For upward movement, *(nL* + *nH* x 256) is negative and pitch *n* is specified as :

n = 65536 – (nL + nH x 256)

Description: Sets the relative vertical print starting position from the current position. This command can also change the horizontal and vertical motion unit. The unit of horizontal and vertical motion is specified by this command.

This command functions as follows, depending on the print starting position set by Select Print Direction in Page Mode (ESC T):

When the starting position is set to the upper left or lower right of the printing area, the vertical motion unit (y) is used.

When the starting position is set to the upper right or lower left of the printing area, the horizontal motion unit (x) is used.

Note : This command is used only in page mode, otherwise it is ignored.

Any setting that exceeds the specified printing area is ignored.

GS ^ r t m - [MP]

1D 5E r t m

Execute Macro

Synopsis: Execute macro.

ASCII	GS	^	*r*	*t*	*m*
Hexadecimal	**1D**	**5E**	**r**	**t**	**m**
Decimal	29	94	*r*	*t*	*m*

Value of *r* The number of times to execute the macro.

Value of *t* The waiting time for executing the macro.

Description: Executes a macro. After waiting for a specified period the printer waits for the Paper Feed Button to be pressed. After the button is pressed, the printer executes the macro once.

The printer repeats this operation the number of specified times.

When the macro is executed by pressing the Paper Feed Button (m = 1), paper cannot be feed by using the Paper Feed Button.

Formulas: The waiting time is t x 100 ms for every macro execution.

m specifies macro executing mode when the LSB (Least significant bit) m = 0

The macro executes r times continuously at the interval specified by t when the LSB (Least significant bit) of m = 1.

Note : If this command is received while a macro is being defined, the macro definition is aborted and the definition is cleared.

If the macro is not defined or if r is 0, nothing is executed.

GS a n - [MP]

1D 61 n

Select or Cancel Unsolicited Status Mode (USM)

Synopsis: Select or cancel unsolicited status mode on current communication interface.

ASCII	GS	a	*n*
Hexadecimal	**1D**	**61**	**n**
Decimal	29	97	*n*

Value of n : 0 turns mode off.

Any non-zero value turns mode on.

For communication Interface USB: Select End point Reply

Interrupt	Bulk
n= [1;127] or [129;255]	*n*= 128

Default: *n* = 0 (USM disabled)

Reply:

Byte 1 = Printer information

Byte 2 = Error information

Byte 3 = Paper information

Byte 4 = Other information

Byte 5 = Count information (*)

Description: Selects whether the printer is to automatically return a 4 or 5 bytes status string whenever the status changes.

Notes: This command uses the same sequence as older ASB (Auto Status Back) but has the following differences :

- The parameter n is an on/off switch. It does not select trigger subset

Any change in any of the following conditions will trigger the USM response

- Receipt Cover.
- Knife Error (if exist).
- Out of range Print head Temperature (Recoverable).
- Out of range motor Temperature (Recoverable).
- Out of range Voltage (Recoverable).
- Dynamic memory allocation Error.
- Papers exhaust Status.
- Paper Jam (if exist).
- Flow Control.
- Paper Feed Button Status (option).
- Power Fail.

(*) If count trigger USM (1F 03 9D m) is different of 0, all five bytes of status are always transmitted else only 4 bytes of status are transmitted.

Recoverable errors include cover open, cutter, paper out, temperature or voltage is out of range,...

This command is processed as normal printer data.

For this command, parameter *n* use Backup memory, so parameter *n* is inchanged after a reset hardware or software. But after a power-down, parameter *n* is lost (*n* = default value USM disabled).

When the Printer is disabled by the “Select Peripheral Devic” command (ESC =), this command is disabled. If this command was previously enabled, status will still be returned.

"GS a" RETURNED STATUS DEFINITION BYTE 1: PRINTER STATUS			
		Value	
Bit(1)	Function	0	1
0	Flash Memory Error	Ok	Failure
1	Sram Memory Error	Ok	Failure
2	Undefined	-	1
3	Printer Busy	Not Busy	Busy
4	Fixed	-	Always 1
5	Cover Position	Closed	Open
6	Feed Switch	No Media Feed	Media Feeding
7	Fixed	Always 0	-

"GS a" RETURNED STATUS DEFINITION BYTE 2: ERROR STATUS			
		Value	
Bit(1)	Function	0	1
0	Packet frame status	Ok	Failure
1	Checksum status	Ok	Failure
2	Packet Error	Ok	Failure
3	Cutter Error Status	Ok	Failure
4	Fixed	Always 0	-
5	Undefined	-	-
	(4) Presenter Last Ticket	OK	Failure
6	Recoverable Error Status	Ok	Failure
7	Fixed	Always 0	-

"GS a" RETURNED STATUS DEFINITION BYTE 3: MEDIA SENSOR STATUS			
		Value	
Bit(1)	Function	0	1
0	Media Low	Present	Low
1	Media Low	Present	Low
2	Media Out	Present	Out
3	Media Out	Present	Out
4	Fixed	Always 0	-
5	Undefined	-	-
	(3) Media Jam	Un Jam	Jam
	4) Last Ticket	Retracted	Taken
6	(3) Undefined	-	-
	(4) Ticket status	No new ticket	New ticket
7	Fixed	Always 0	-

"GS a" RETURNED STATUS DEFINITION BYTE 4: COMMUNICATIONS or NO TRIGGER FAILURE STATUS			
		Value	
Bit(1)	Function	0	1
0	Power Fail (2)	No	Yes
1	Temperrature Over Status	No	Yes
2	Voltage Over Status	No	Yes
3	Undefined	-	-
4	Fixed	Always 0	-
5	Undefined	-	-
6	Undefined	-	-
7	Fixed	Always 0	-

"GS a" RETURNED COUNT BYTE 5			
		Value	
Bit(1)	Function	0	1
0	Bit 0 of count (LSB)	0	1
1	Bit 1 of count	0	2
2	Bit 2 of count	0	4
3	Bit 3 of count	0	8
4	Fixed	Always 0	-
5	Bit 4 of count	0	16
6	Bit 5 of count (MSB)	0	32
7	Fixed	Always 0	-

(1) Unused, reserved or undefined bit(s) set to 0.
(2) Flag Power fail is cleared with Prn received command (1D 0A; 1F 76 01) and also with real time command (10 19 01).
(3) Paper jam system enabled.
(4) Presenter Mode enabled.

GS f n - [MP]
1D 66 n
Select Pitch of HRI Character

Synopsis: Select pitch of HRI character.

ASCII	GS	f	n
Hexadecimal	**1D**	**66**	**n**
Decimal	29	102	n

Value of *n* 0 = Standard Pitch at 12.7 CPI (Elite).
1 = Compressed Pitch at 16.9 CPI (Pica)

Default : 1 (pica)

Description: Select font used to print HRI characters.

GS h n - [MP]
1D 68 n
Select Bar Code Height

Synopsis: Select bar code height.

ASCII	GS	h	*n*
Hexadecimal	**1D**	**68**	**n**
Decimal	29	104	*n*

Operand: n = Number of dots
Limits: 1≤ n ≤ 255
Default = 216 dots

Description: Sets the bar code height to *n* dots or *n*/203 inch (*n*/8 mm).

Print Bar Code first variation
GS k m d1…dk NUL - [MP]
1D 6B m d1…dk NUL
Print Bar Code second variation
GS k m n d1…dn - [MP]
1D 6B m n d1…dk

Synopsis: Selects the bar code type and prints a bar code for the ASCII characters entered.

	First Variation					Second Variation				
ASCII	GS	k	*m*	*d1...dn*	*NUL*	GS	k	*m*	*n*	*d1…dn*
Hexadecimal	**1D**	**6B**	m	***d1...dn***	**00**	**1D**	**6B**	m	**n**	**d1…dn**
Decimal	29	107	*m*	*d1...dn*	*0*	29	107	*m*	*n*	*d1…dn*

(0 = End of command)

Operands: See tables below.

Description: There are two variations to this command.

The first variation uses a NULL character to terminate the string; the second uses a length byte at the beginning of the string to compensate for the Code 128 bar code that can accept a NULL character as part of the data.

With the second variation the length of byte is specified at the beginning of the string.

Bar codes can be aligned left, center, or right using the Align Positions command (1B 61 n).

The check digit is calculated for UPC and JAN (EAN) codes if it is not sent from the host computer.

Six-character zero-suppressed UPC-E tags are generated from full 11 or 12 characters sent from the host computer according to standard UPC-E rules.

Start/Stop characters are added for Code 39 if they are not included.

Rotated barcodes set with small modules (select bar code width command 1D 77 n, n=2 and barcodes in any orientation are printed at low speed, for better readability.

Exceptions: The command is only valid at the beginning of a line.

Illegal data cancels the command.

If the width of the bar code exceeds one line, the bar code is not printed.

First Variation: Data string terminated with specific Character (*) (NULL or ~NULL), see table below.

Description: The value of *m* selects the bar code system as described in the table.

The variable *d* indicates the character code to be encoded into the specified bar code system. See the table.

Exceptions: If character code *d* cannot be encoded, the printer prints the bar code data processed so far, and the following data is treated as normal data.

m	Bar Code	d	n, Length	(*)
0	UPC-A	48- 57 (ASCII numerals)	Fixed Length: 11, 12	0
1	UPC-E	48- 57	Fixed Length: 11, 12	0
2	JAN13 (EAN)	48- 57	Fixed Length: 12, 13	0
3	JAN8 (EAN)	48- 57	Fixed Length: 7,8	0
4	Code 39	48- 57, 65- 90 (ASCII alphabet), 32, 36, 37, 43, 45, 46, 47 (ASCII special characters) d1 = dk = 42 (start/stop code is supplied by printer if necessary)	Variable Length	0
5	Interleaved 2 of 5	48- 57	Variable Length (Even Number)	0
6	Coda bar	65- 68, start code 48- 57, 36, 43, 45, 46, 47, 58	Variable Length	0
11	Code 93	0-127	Variable	255
12	Code 128	0-105 *d1* = 103-105 (must be a Start code) *d2* = 0-102 (data bytes) (Stop code is provided by the printer)	Variable	255
13	Data Matrix ECC200 (1)	32-255	Variable (max = 255)	0
14	QR Code (1)	32-255	Variable (max = 255)	0

Second Variation: Length of Byte Specified at Beginning of String

Description: The value of *m* selects the bar code system as described in the table.

The value of n specified length of byte.

The variable *d* indicates the character code to be encoded into the specified bar code system. See the table.

Exceptions: If character code *d* cannot be encoded, the printer prints the bar code data processed so far, and the following data is treated as normal data.

m	Bar Code	d	n, Length
65	UPC-A	48- 57 (ASCII numerals)	Fixed Length: 11, 12
66	UPC-E	48- 57	Fixed Length: 11, 12
67	JAN13 (EAN)	48- 57	Fixed Length: 12, 13
68	JAN8 (EAN)	48- 57	Fixed Length: 7, 8
69	CODE39	48- 57, 65- 90 (ASCII alphabet), 32, 36, 37, 43, 45, 46, 47 (ASCII special characters) *d1* = *dk* = 42 (start/stop code is supplied by printer if necessary)	Variable
70	Interleaved 2 of 5 (ITF)	48- 57	Variable (Even Number)
71	CODABAR (NW-7)	65- 68, start code 48- 57, 36, 43, 45, 46, 47, 58	Variable
72	Code 93	0-127	Variable
73	Code 128	0-105 *d1* = 103-105 (must be a Start code) *d2* = 0-102 (data bytes) (Stop code is provided by the printer)	Variable
76	Datamatrix ECC200 (1)	0 - 255	Variable (max = 1000)
77	QR Code (1)	0 - 255	Variable (max = 1000)

(1) Install Free External Module “Bar code 2D”, contact your provider.

GS l m - [MP] [DBG]
1D 6C m
Transmit Selected A/D Channel

Synopsis: Transmit selected A/D channel (Sensors, Voltage, Temperature …).

ASCII	GS	l	*m*
Hexadecimal	**1D**	**6C**	**m**
Decimal	29	108	*m*

Operand: **m** = Selected channel :

	Hex	Dec	
Value of *m*	00	0	= No used.
	01	1	= Sensor Paper Out value.
	02	2	= Paper Jam.
	03	3	= Knife Position.
	04	4	= No used.
	05	5	= Top Of Form.
	06	6	= Paper Low.
	07	7	= No used.
	08	8	= Power Supply Voltage value.
	09	9	= Temperature Head value.
	0A	10	= Door Open.
	0B	11	= Head Voltage value.
	0C	12	= Auxiliary sensor.
	0D	13	= Presenter Input.
	0E	14	= Presenter Output.

Returns: 2 Bytes , see below
Reply: first byte LSB + reply second byte MSB
Limit reply: 00 ≤ Byte (LSB,MSB) ≤ FF 0 ≤ Byte (LSB,MSB) ≤ 255

Description: Returns the value of sensors, voltage or temperature.
Note : If m no defined, reply 2 bytes “21, 21” decimal or “15, 15” hexadecimal or “NAK, NAK” ASCII.
If switch sensor reply only two values “00, 00” or “01, 00” (example knife Position m = 03).
See also commands (1F 0A 84 read Voltage, 1F 0A 85 read Temperature).

GS m nthick nthin[MP]

1D 6D nthick nthin

Set Bar Code Aspect Ratio (ITF and Code39 only)

Synopsis:	Set Bar code aspect ratio (ITF and Code39 only).			
ASCII	GS	m	nthick	nthin
Hexadecimal	**1D**	**6D**	**nthick**	**nthin**
Decimal	29	109	*nthick*	*nthin*

Value of	***nthick***	2 ≤ nthick ≤ 6 nthick > nthin
Value of	***nthin***	1 ≤ nthin ≤ 5

Default:	***nthick***	= 2
	nthin	= 1

Description: For ITF and Code39 bar codes, set elementary bar thickness for thin and thick bars.

GS s n - [MP]

1D 72 n

Transmit status (Paper sensor Status, Flash memory User Sector status).

Synopsis:	Transmit status (Paper sensor Status, Flash memory User Sector status).		
ASCII	GS	I	*n*
Hexadecimal	**1D**	**72**	**n**
Decimal	29	114	*n*

Operand:	n	= Mode selection
Value of n	1, 49	= Paper sensor Status.
	2, 50	= Reserved.
	4, 52	= Flash memory User Sector status.
Returns:	1	Byte. The status bytes to be transmitted are described in the following tables:

Description: Transmits the status specified by n.

This is a batch mode command which transmits the response after all prior data in the receive buffer has been processed.

There may be a time lag between the printer receiving this command and transmitting the response, depending on the receive buffer status.

Note: When n is out of the specified range, the command is ignored.

Paper sensor Status (*n* = 1 or *n* = 49)

Bit	Off/On	Hex	Decimal	Status for Transmit Status
0	Off	00	0	Paper Present.
	On	01	1	Paper Low.
1	Off	00	0	Cover Closed.
	On	02	2	Cover Open.
2	Off	00	0	Paper Present.
	On	04	4	Paper exhausted.
3	Off	00	0	Paper Present.
	On	08	8	Paper exhausted.
4	Off	00	0	Fixed to Zero.
5	Off	00	0	No Paper Jam.
	On	20	32	Paper Jam.
6	-	-	-	Undefined.
7	Off	00	0	Fixed to Zero.

Flash memory User Sector Status (*n* = 4 or *n* = 52)

Bit	Off/On	Hex	Decimal	Status for Transmit Status
0	-	-	-	Undefined.
1	-	-	-	Undefined.
2	Off	00	0	Not Used. Fixed to off
3	Off	00	0	Flash Logo area adequate, definition stored.
	On	08	8	Flash logo area not adequate.
4	Off	00	0	Fixed to Zero.
5	Off	00	0	No user-defined characters written to flash.
	On	20	32	User-defined characters written to flash
6	Off	00	0	Not used. Fixed to off.
7	-	-	-	Fixed to Zero.

GS s m n - [MP]
1D 73 m n
Store Selected Sensor Threshold

Synopsis: This command configures the sensors detection threshold (NVM).

ASCII	GS	s	*m*	*n*
Hexadecimal	**1D**	**73**	**m**	**n**
Decimal	29	115	*m*	*n*

Operands : *m* = Sensor select

n = Threshold value

Limit : **Dec:** $0 \le m \le 7$; $m = 17$; $m = 20$; $m = 23$

Hex: $00 \le m \le 07$; $m = 11$; $m = 14$; $m = 17$

Description: This command will store the sensor detection threshold in non-volatile memory (NVM).
See Table below

Note: This command must be followed by a reset.

"GS s" OPERAND DEFINITION						
m		**Sensor**			**n (Decimal)**	
Dec	**Hex**	**Connector**	**Sensor**	**Mechanism** (1)	**Limit**	**Default**
0	00	-	-	-	-	-
1	01	J6-2	Paper Out	TRITON80-TRITON80	$0 \leq n \leq 255$	144
2	02	-	-	-	-	-
3	03	J2-3	Cutter	TRITON80-TRITON80	N/A	-
4	04	J6-5	Door	TRITON80-TRITON80	$0 \leq n \leq 255$	128
5	05	J6-2	TOF	TRITON80-TRITON80	$0 \leq n \leq 255$	100
6	06	J7-3	Paper Low	TRITON80	$0 \leq n \leq 255$	128
7	07	J8-5	Paper Jam	TRITON80-TRITON80	$0 \leq n \leq 255$	100
17	11	J8-6	Auxiliary	TRITON80-TRITON80	$0 \leq n \leq 255$	128
20	14	J8-5	Presenter Input	TRITON80	$0 \leq n \leq 255$	170
23	17	J8-6	Presenter Output	TRITON80	$0 \leq n \leq 255$	128

(1) Kiosk TRITON-KALIPSO use CM-RM PREMIUM mechanism.

GS t - [MP]

1D 74

Automatic calibration sensor TOF

Synopsis: This command configures the sensors detection threshold (NVM).

ASCII	GS	t
Hexadecimal	**1D**	**74**
Decimal	29	116

Reply: **3 bytes:**

1 byte = Measure Maximal

2 byte = Measure minimal

3 byte = New Threshold

If 3 byte =0 Bad measure.

Description: Startup an automatic measurement for detected the best threshold value on the sensor with the paper used. If measurement is good the command will store the sensor detection threshold in non-volatile memory (NVM).

Note: The measured value is an average value. According to the types of paper, the type of detection (a hole, a black mark ...) and the size detection. We can observe in some cases an error on the distance between the mark and cut.

If the distance obtained is smaller increase the measured threshold.

If the distance obtained is greater decreased the measured threshold.

To change the threshold used the command <1D 73 05 n> to read the threshold used the command <1F 07 73 05>.

You can also correct the position error by entering a distance correction parameter to the printer. For this use the command "Set Offset Mark", see command <1F 03 8E n>.

This command must be followed by a reset.

GS u d0 … d9 - [MP]

1D 75 d0 … d9

Store User Revision Number

Synopsis:	Store user revision number.		
ASCII	GS	u	d0 … d9
Hexadecimal	**1D**	**75**	**d0 … d9**
Decimal	29	117	d0 … d9

Operand :	dn = downloaded revision number	
Limits	Decimal :	32 ≤ dn ≤ 126
	Hex :	20 ≤ dn ≤ 7E
Default:	Decimal :	dn = 47
	Hex :	dn = 30

Description: This command will store a 10-character user defined revision number downloaded to the printer.

Note: The user defined revision number is printed on the configuration *(self test - diagnostic form)*.

GS v 0 m xL xH yL yH d1 … dk - [MP]
1D 76 30 m xL xH yL yH d1 … dk
Print Raster Bit Image

Synopsis: Print raster bit image.

ASCII	GS	U	0	m	xL	xH	yL	yH	d1 … dk
Hexadecimal	**1D**	**76**	**30**	**m**	**xL**	**xH**	**yL**	**yH**	**d1 … dk**
Decimal	29	117	48	m	xL	xH	yL	yH	d1 … dk

Operand : m = Selects Raster bit-image mode.
(xL + xH*256) = Width
(yL + yH*256) = Height
k = (Width * Height)

Limits

Decimal : m = 0 or 48
Hex : m = 00 or 30

Decimal : 1 ≤ Width ≤ 80
Hex : 01 ≤ Width ≤ 50

Decimal : 1 ≤ Height ≤ 65535
Hex : 01 ≤ Height ≤FFFF

Description: Print windows raster bit image.

Note: When Width or Height is out of the specified range, the command is ignored.

m	**Mode**	**Vertical Dot Density**	**Horizontal Dot Density**
0, 48	Normal	8 dots/mm	8 dots/mm

GS w n - [MP]
1D 77 n
Select Bar Code Width

Synopsis: Select bar code width.

ASCII	GS	w	*n*
Hexadecimal	**1D**	**77**	**n**
Decimal	29	119	*n*

Operand: n = thickness of thin line in dots.
Range 1 ,2, 3, 4, 5,6
Default 3
Formulas *n*/203 inch (*n*/8 mm).
Thick line is always n*2 dots.

Description: Sets the bar code module to n/203 inch (n/8 mm).
Note : If n=1, than the thin bars will be 1 dot in the thickness and thick bars will be 2 dots.

GS x - [MP]

1D 78

Transmit User Revision Number

Synopsis:	Transmit user revision number.	
ASCII	GS	x
Hexadecimal	**1D**	**78**
Decimal	29	120

Description: This command will transmit the 10-character printable ASCII user defined revision number.

Note : The returned revision number may contain a bit pattern that is valid for returned status. Care should be taken not to confuse this returned data with any other returned data.

GS ² - [BP]

1D FD

Return EEPROM Type

Synopsis:	Return Non-Volatile Memory type.	
ASCII	GS	²
Hexadecimal	**1D**	**FD**
Decimal	29	253

Description: Reply one byte. “I” for internal NVM.

GS ■ - [BP]

1D FE

Return Flash Memory Type

Synopsis:	Return flash type.	
ASCII	GS	■
Hexadecimal	**1D**	**FE**
Decimal	29	254

Description: Reply five bytes. “No ID” for internal flash.

GS SP – [BP] [MP]

1D FF

Reset Firmware

Synopsis:	Reset firmware.	
ASCII	GS	SP
Hexadecimal	**1D**	**FF**
Decimal	29	255

Description: Reboots the printer.

US SOH d1…dn - [BP]

1F 01 d1…dn

Erase Boot Sector, Download New Code

Synopsis:	Erase boot sector and download new boot code.		
ASCII	US	SOH	*d1…dn*
Hexadecimal	**1F**	**01**	**d1…dn**
Decimal	31	1	*d1…dn*

Value and range

n = 32768 (Actual Boot Loader size 32Ko)

n = 16384 (Actual Boot Strap size 16Ko)

Description: Wait for new boot code to be downloaded, then check CRC on this new boot code, and if valid, boot code sector is erased and reprogrammed with new code. Printer automatically reboots after program sequence is complete (Boot = boot Strap + Boot Loader).

Note : Available only in download mode.

During erase and download sequence, power supply must be maintained at all times and no reset sequence should be performed. (See also Command 1F 09…)

US STX n1 n2 n3 n4 n5 n6 - [BP]

1F 02 n1 n2 n3 n4 n5 n6

Set Communication Interface Parameters in NVM

Synopsis: Set communication interface parameters (NVM).

ASCII	US	STX	*n1*	*n2*	*n3*	*n4*	*n5*	*n6*
Hexadecimal	**1F**	**02**	**n1**	**n2**	**n3**	**n4**	**n5**	**n6**
Decimal	31	2	*n1*	*n2*	*n3*	*n4*	*n5*	*n6*

Operands:

n1	Interface selection for parameters (RS232, USB).
n2 – n6	Parameters

RS232 parameters (n1=00)

Default: (*) 00 07 00 00 01 00 02 — RS232, 115200, n, 8, 1, Ignored, On.

Bytes Values :	**Hexadecimal**		
n1 bits [0…7] :	00	Interface RS232 selection.	(*)
n2 bits [0…2] :	00	Baudrate = 1200	
	01	Baudrate = 2400	
	02	Baudrate = 4800	
	03	Baudrate = 9600	
	04	Baudrate = 19200	
	05	Baudrate = 38400	
	06	Baudrate = 57600	
	07	Baudrate = 115200	(*)
n2 bit [4] :	00	Number of stop bit(s) = 1	(*)
"	10	Number of stop bit(s) = 2	
n2 bit [5] :	00	Number of Data Bits = 8	(*)
"	20	Number of Data Bits = 1	
n3 bits [0…7] :	00	Parity Mode = Odd Parity	(*)
"	01	Parity Mode = Event Parity	
n4 bits [0…7] :	00	Parity Select = No Parity	(*)
"	01	Parity Select = Enabled and set using parameter described above.	
n5 bits [0…1] :	00	Handshaking = Xoff/ Xon	
"	01	Handshaking = DTR/DSR	(*)
"	02	Handshaking = Dual Mode.	
n6 bit [0]:	00	Error processing = Ignored	(*)
"	01	Error processing = Print '?'	
n6 bit [1]:	00	Break Line = Off	
	02	Break Line = Enabled = reset printer.	(*)

USB parameters(n1=03)

Default: (**) 03 01 00 00 00 00 00 00 — USB, 4 End points.

Bytes Values :	Hexadecimal		
n1 :	03	Interface USB Selection.	
n2 :	00	3 End-Points.	
"	01	4 End-Points.	(**)
n3 :	Fixed to 00	Undefined.	
n4 :	Fixed to 00	Undefined.	
n5 :	Fixed to 00	Undefined.	
n6 :	Fixed to 00	Undefined.	

Description: This command will store the communication options in non-volatile memory.

Notes:

1. **This command is processed only in boot mode. If the printer is running in normal mode, send first command "switch to Boot Mode" (1B 5B 7D).**
2. **This command must be followed by "Printer Reset" command (1D FF).**

US ETX NUL n - [MP]

1F 03 00 n

Set Diagnostic Mode in NVM

Synopsis: Set diagnostic mode in Non-Volatile Memory.

ASCII	US	ETX	NUL	n
Hexadecimal	**1F**	**03**	**00**	**n**
Decimal	31	3	*0*	*n*

Operand: n = mode selection

Value Decimal

0	Normal Operation	
1	Data Scope Mode	= Print all data received in ascii sequence.
2	Receipt Print Test	= Push Button, print all code Page in Compressed Pitch.
3	Demo Mode 0	= Push button, print 4 logo(s) if defined.
4	No used. Normal Mode	= -.
5	Com Data Scope Mode	= Same Data Scope Mode, but data transmit on USB.
6	Demo Mode 1	= Push button, print logo defined and set next logo defined.

Default 0

Limit: Dec : $0 \leq n \leq 6$

Hex: $00 \leq n \leq 06$

Description: This command will store the printer diagnostics mode in Non-Volatile Memory.
This mode is used to select a test mode

Note: This command must be followed by a reset.
Exit Data Scope Mode or exit COM Scope Mode send command sequence "1F 03 00 00" and stop and restart power supply.

US ETX STX n - [MP]

1F 03 02 n

Set Knife Option in NVM

Synopsis: Select Set knife option and store value in Non-Volatile Memory.

ASCII	US	ETX	STX	n
Hexadecimal	**1F**	**03**	**02**	**n**
Decimal	31	3	*2*	*n*

Operand: n = mode selection

Dec	Hex	Mode
0	00	Disabled
1	01	Enabled – Normal Speed, High Torque mode
2	02	Enabled – High speed mode(1)

Default: 0 Disabled

Limit: **Dec:** $0 \leq n \leq 2$

Hex: $00 \leq n \leq 02$

Description: This command will store the knife option in non-volatile memory.

Note: This command must be followed by a reset.

(1) Type n =02, phase 2 (End Q2 2013).

US ETX ETX n - [MP]

1F 03 03 n

Set Paper Low Sensor Option in NVM

Synopsis: Select paper low sensor option and store value in Non-Volatile Memory.

ASCII	US	ETX	ETX	n
Hexadecimal	**1F**	**03**	**03**	**n**
Decimal	31	3	*3*	*n*

Operand: n = mode selection

Dec	Hex	Mode
0	00	Disabled
1	01	Enabled

Default: 0 Disabled

Limit: **Dec:** $0 \leq n \leq 1$

Hex: $00 \leq n \leq 01$

Description: This command will store the paper low sensor option in non-volatile memory.

Note: This command must be followed by a reset.

US ETX EOT m - [MP]

1F 03 04 m

Set Maximum Power Consumption in NVM

Synopsis: Set maximum power consumption in Non-Volatile Memory.

ASCII	US	ETX	EOT	m
Hexadecimal	**1F**	**03**	**04**	**m**
Decimal	31	3	*4*	*m*

Operand: m = Power in Watt

Default Dec : 55 Watt

Hex: 37

Limit: Dec: 55 ≤ m ≤ 255

Hex: 37 ≤ *m* ≤ FF

Description: This command will store the power consumption in non-volatile memory.

Note: This command must be followed by a reset.

Example:

Dec.	Hex.	Value
55	37	55 Watt
75	4B	75 Watt
90	5A	90 Watt

US ETX BS n - [MP]

1F 03 08 n

Set Paper Width in NVM

Synopsis: Select paper width and save in Non-Volatile Memory.

ASCII	US	ETX	BS	n
Hexadecimal	**1F**	**03**	**08**	**n**
Decimal	31	3	*4*	*n*

Operand: n = selection paper width. See Table below

Limit: Dec: 0, 1, 3

Hex: 00, 01, 03

Description: This command will store *the paper type* selection in non-volatile memory.

Note: This command must be followed by a reset.

PAPER WIDTH OPERAND DEFINITION			
n			**Logo and graphic width printable**
Decimal	**Hex**	**Mode**	
0	00	80 mm	576 dots (76mm)
1	01	82.5 mm	640 dots (80mm)
3	03	60 mm	448 dots (56mm)

US ETX LF n - [MP]

1F 03 0A n

Set Partial Cut Distance in NVM

Synopsis: Select in table parameters the partial cut distance value and save in Non-Volatile Memory.

ASCII	US	ETX	LF	n
Hexadecimal	**1F**	**03**	**0A**	**n**
Decimal	31	3	*10*	*n*

Operand: n = Selection predefined motor steps. See Table below.

Default: 1 130 Knife motor steps.

Description: This command will store the *partial cut distance* parameter in non-volatile memory.

Note: This setting must be set to match the mechanism connected to the board, in order to get partial cut position matching the knife notch.

This setting is used to compensate for mechanical tolerances on parts involved in knife operation.

This command must be followed by a reset.

There are two codes for this function, see also command Set Partial Cut Distance (1F 0E 01 nL nH).

PARTIAL CUT DISTANCE OPERAND DEFINITION		
n		
Decimal	**Hex**	**Mode**
0	00	125 knife motor steps
1	01	130 knife motor steps
2	02	135 knife motor steps
3	03	140 knife motor steps
4	04	145 knife motor steps

US ETX VT n - [MP]

1F 03 0B n

Set Printhead Pre-Heating Mode in NVM

Synopsis: Select Pre-heating value and save in Non-Volatile Memory.

ASCII	US	ETX	VT	n
Hexadecimal	**1F**	**03**	**0B**	**n**
Decimal	31	3	*11*	*n*

Operand: n = mode selection

Dec	Hex	Mode
0	00	Disabled
1	01	Enabled

Default: 0 Disabled

Limit: **Dec:** $0 \leq n \leq 1$

Hex: $00 \leq n \leq 01$

Description: This command will store the *printhead Pre-heating Mode* parameter in non-volatile memory.
When this mode is enabled, the controller monitors the printhead temperature and keeps it above 35°C.

Note: This command must be followed by a reset.

US ETX VT m - [MP]

1F 03 0F m

Set Default Font in NVM

Synopsis: Set default resident or user font option in Non-Volatile Memory.

ASCII	US	ETX	VT	m
Hexadecimal	**1F**	**03**	**0F**	**m**
Decimal	31	3	*15*	*m*

Operand:	m	= Mode selection
Value Decimal:	0	Resident font n°0 (12x24 = Pica).
	1	User font.
	2	Resident font n°1 (16x24 = Elite).
	3	Resident font n°2 (16x24 = Elite).
	48	Easy font n°'0'.
	49	Easy font n°'1'.
	50	Easy font n°'2'.
	51	Easy font n°'3'.
Default:	0	12x24 (Pica).

Limit:	Dec:	0≤ m ≤3 and 48≤ m≤51
	Hex:	00≤ m ≤ 03 and 30 ≤ m ≤ 33

Description: This command will store the *default font option* in non-volatile memory.

Notes: The default font selects which font will be initially used by the printer.
If user or easy font is selected and no present in memory, the default font is used.
This command must be followed by a reset.

US ETX DC3 n0 …n4 - [MP]
1F 03 13 n0 n1 n2 n3 n4 n5
Set Opto Sensor Assignation in NVM

Synopsis: Assign function to optical or switch sensors (Sensor 0, 1, 2, 3, and Sensor 4).

ASCII	US	ETX	DC3	n0	n1	n2	n3	n4	n5
Hexadecimal	**1F**	**03**	**13**	**n0**	**n1**	**n2**	**n3**	**n4**	**n5**
Decimal	31	3	19	*n0*	*n1*	*n2*	*n3*	*n4*	*n5*

Operands n0…n5:

00	Sensor *Off*.
01	ID board "*Sensor_0*" connector J6-2 (pin 2).
02	ID board "*Sensor_1*" connector J7-3 (pin 3).
03	ID board "*Sensor_2*" connector J8-5 (pin 5).
04	ID board "*Sensor_3*" connector J8-6 (pin 6).
05	ID board "*Sensor_4*" connector J6-5 (pin 5).

Operand: n0 = Paper Out
Limit: **Dec:** 0 ≤ n0 ≤ 5
Hex: 00 ≤ n0 ≤ 05
Default: 01 = "*Sensor_0*" – Connector J6-2.

Operand: n1 = Paper Low
Limit: **Dec:** 0 ≤ n1 ≤ 5
Hex: 00 ≤ n1 ≤ 05
Default: 02 = "*Sensor_1*" – Connector J7-3.

Operand: n2 = Top Of Form
Limit: **Dec:** 0 ≤ n2 ≤ 4
Hex: 00 ≤ n2 ≤ 04
Default: 01 = "*Sensor_0*" – Connector J6-2.

Operand: n3 = Paper Jam/ (1) Presenter Input
Limit: **Dec:** 0 ≤ n3 ≤ 5
Hex: 00 ≤ n3 ≤ 05
Default: 03 = "*Sensor_2*" – Connector J8-5.

Operand: n4 = Auxiliary / (1) Presenter Output
Limit: **Dec:** 0 ≤ n4 ≤ 5
Hex: 00 ≤ n4 ≤ 05
Default: 04 = "*Sensor_3*" – Connector J8-6.

Operand: n5 = Door Open
Limit: Dec: 0 ≤ n5 ≤ 5
Hex: 00 ≤ n5 ≤ 05
Default: 04 = "Sensor_4" – Connector J6-5.

Description: This command will store *Sensors Assignation option* in non-volatile memory. See also Electronic board for more information's.

Notes: This command must be followed by a reset.

(1) If presenter option enabled.

US ETX § n - [MP]

1F 03 15 n

Set TOF Paper path in NVM

Synopsis:	This command will store TOF paper path setting in non-volatile memory			
ASCII	US	ETX	*§*	*n*
Hexadecimal	**1F**	**03**	**15**	**n**
Decimal	31	3	*21*	*n*

Operand: n = Select Mode (Depend also of mechanical specification)

0 Clamshell or Front.

1 Straight or Bottom.

Default: 1 (See figure below)

Limit: **Dec:** 0 ≤ n ≤ 1

Hex: 00 ≤ n ≤ 01

Description: This command will store the paper path type in non-volatile memory.

Notes: Same command <1F 03 A2 n>.

This command must be followed by a reset.

US ETX Ç m - [MP]

1F 03 80 m

Set Default Code Page in NVM

Synopsis:	Set default code page option in Non-Volatile Memory.			
ASCII	US	ETX	Ç	m
Hexadecimal	**1F**	**03**	**80**	**m**
Decimal	31	3	*128*	*m*

Operand: m = Mode Code Page

Value Decimal:		
0	437	: US
1	850	: Multilingual
2	852	: Latin 2, Slavic
3	860	: Portuguese
4	863	: Canadian French
5	865	: Nordic
6	858	: Multilingual Latin 1 + Euro
7	866	: Cyrillic, Russian
8	1252	: Windows, Latin 1
9	862	: Hebrew

10	-	: KATAKANA
11	1253	: Windows, Greek
12	737	: Greek

Default: 0 (437)

Limit: Dec: $0 \leq m \leq 12$
Hex: $00 \leq m \leq 0B$

Description: This command will store the default code page option in non-volatile memory (NVRAM).

Notes: The default code page selects which code page will be initially used by the printer until it is changed using the “ESC t” command.

This command must be followed by a reset.

US ETX ü n - [MP]

1F 03 81 n

Set Presenter On/Off Option in NVM

Synopsis:	Select the presenter option and save it in NVM.			
ASCII	US	ETX	ü	n
Hexadecimal	**1F**	**03**	**81**	**n**
Decimal	31	3	129	*n*

Operand: n = select the Presenter Option.

Limits:

Decimal:	$0 \leq n \leq 1$	
Hexadecimal:	$00 \leq \mathbf{n} \leq 01$	(00 =Disabled ;01 =Enabled)

Default:

Decimal:	0	Disabled
Hexadecimal:	00	

Description: This command will store *Presenter option* in non-volatile memory.
This option activates the presenter for KALIPSO 80.

Notes: This command must be followed by a reset.

US ETX é n - [MP]

1F 03 82 n

Set Minimum receipt Length in NVM

Synopsis: Minimum receip length.

ASCII	US	ETX	é	n
Hexadecimal	**1F**	**03**	**82**	**n**
Decimal	31	3	*130*	*n*

Operand: n = receipt length selection

Value Decimal:

0	30 mm
1	40 mm
2	50 mm
3	60 mm
4	70 mm
5	80 mm
6	100 mm
7	130 mm
8	150 mm
9	225 mm
10	300 mm
11	375 mm
12	450 mm
13	525 mm
14	600 mm
15	0 mm
16	76 mm
17	12 mm

Default: 17 = 12 mm

Limit: Dec: $0 \leq n \leq 17$

Hex: $00 \leq n \leq 11$

Description: This command will store the minimum receipt length in non-volatile memory (NVM).

Notes: With the cutter, for CM-RM Premium mechanism the minimum receipt length is 12mm.

When the CM-RM Premium mechanism using the jam detector system, the minimum receipt length is set to 40mm if lower.

This command must be followed by a reset.

US ETX ç m - [MP]

1F 03 87 m

Set Top Of Form option in NVM

Synopsis:	Set Top Of Form option and store in Non-Volatile Memory. (1)			
ASCII	US	ETX	ç	m
Hexadecimal	**1F**	**03**	**87**	**m**
Decimal	31	3	*135*	*m*

Operand:	m	= Select TOF option
Value Decimal:	0	Disable
	1	Present
Default:	0	(Disable)
Limit:	Dec:	$0 \leq m \leq 1$
	Hex:	$00 \leq m \leq 01$

Description: This command will store the *Top Of Form* option in non-volatile memory.

Note: This command must be followed by a reset.

US ETX ë m - [MP]
1F 03 89 m
Set Cover sensor option in NVM

Synopsis: Set cover sensor option in Non-Volatile Memory. (1)

ASCII	US	ETX	ë	m
Hexadecimal	**1F**	**03**	**89**	**m**
Decimal	31	3	*143*	*m*

Operand: m = Select Cover option

Value Decimal:
0 Disable
1 Present

Default: 0 (Disable)

Limit: Dec: 0 ≤ m ≤ 1
Hex: 00 ≤ m ≤ 01

Description: This command will store the *Cover Sensor* option in non-volatile memory.
When disable, cover condition is never checked.

Note: This command must be followed by a reset.

US ETX ï n - [MP]
1F 03 8B n
Set Mechanism Type in NVM

Synopsis: Set mechanism type and save in Non-Volatile Memory.

ASCII	US	ETX	Ï	n
Hexadecimal	**1F**	**03**	**8B**	**n**
Decimal	31	3	*139*	*n*

Operand: n = Select Mechanism

Value:

MECHANISM TYPE OPERAND DEFINITION		
n		**Type**
Dec	**Hex**	
14	0x0E	MGTA (MGTA+ ? a voir avec Fred)

Default: 14 MGTA

Limit: Dec: 14,
Hex: 0E,

Description: This command allows selecting a mechanism type.

Note: This command must be followed by a reset.

US ETX Ä n - [MP]
1F 03 8E n
Set One Offset Start Mark TOF in NVM

Synopsis: Set offset start TOF mark and store this parameter in Non-Volatile Memory.

ASCII	US	ETX	Ä	n
Hexadecimal	**1F**	**03**	**8E**	**n**
Decimal	31	3	*142*	*N*

Operand: **n** = Signed Offset Start TOF Mark (1/10mm)

Default: **0** 1/10 mm

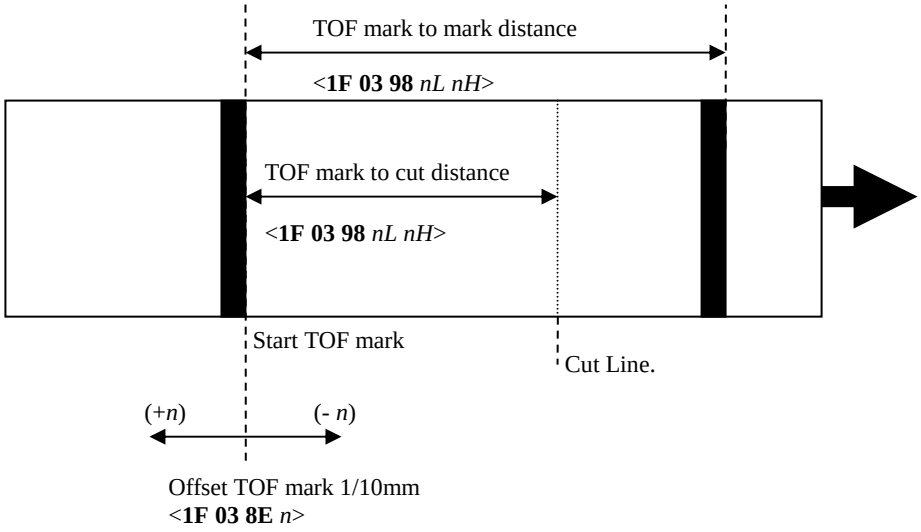
Limit: **Dec:** 0 ≤ n (1/10mm) ≤ 127 ➔ 0.0 mm ≤ n ≤ +12.7mm.
Hex: 00 ≤ n (1/10mm) ≤ 7F

Limit: **Dec:** 128 ≤ n (1/10mm) ≤ 255 ➔ -12,8mm ≤ n ≤ -0.1 mm.
Hex: 80 ≤ n (1/10mm) ≤ FF

Description: You can use this command for move the start of the TOF mark (1/10mm) and save this parameter in NVM.

Example: After automatic calibration, the distance measured from the TOF mark cut is above or below the set point (special case). You can apply a displacement of beginning of the TOF mark, for find the desired set point (= Distance Mark TOF to cut line).

Note: This command must be followed by a reset.



US ETX Å n - [MP]
1F 03 8F n
Set Paper Type in NVM

Synopsis: This command allows selecting a paper type, and save in Non-Volatile Memory.

ASCII	US	ETX	Å	n
Hexadecimal	**1F**	**03**	**8F**	**n**
Decimal	31	3	*143*	*n*

Operand: n = Selection paper type

Value:

SET PAPER TYPE		
n		
Decimal	**Hex**	**Paper type**
0	00	LOTTERY CLASS
1	01	POS CLASS

Default: 1 Paper Pos class.

Limit: Dec: 0 ≤ n ≤ 1
Hex: 00 ≤ n ≤ 01

Description: This command will store the *Paper type* option in non-volatile memory.

Notes: This command must be followed by a reset.

US ETX É m - [MP]
1F 03 90 m
Set Fault Recovery Mode in NVM

Synopsis: Select fault recovery mode in Non-Volatile Memory..

ASCII	US	ETX	É	m
Hexadecimal	**1F**	**03**	**90**	**m**
Decimal	31	3	*144*	*m*

Operand: m = Mode selection

Value Decimal: 0 Automatic Restart
1 Host Controlled

Default: 0 (automatic restart)

Limit: Dec: 0 ≤ m ≤ 1
Hex: 00 ≤ m ≤ 01

Description: This command will store the *fault recovery* mode option in non-volatile memory.

Notes: This mode is used to select the printer behaviour after all fault conditions are cleared : The printer can either automatically restart from where it stops, or wait until it receives a specific real time command “Real Time Recovery From Fault”

This command must be followed by a reset.

US ETX æ m - [MP]
1F 03 91 m
Set Low Voltage Detection Mode in NVM

Synopsis: Select low voltage detection mode in Non-Volatile Memory.

ASCII	US	ETX	æ	m
Hexadecimal	**1F**	**03**	**91**	**m**
Decimal	31	3	*145*	*m*

Operand: m = Mode selection

Value Decimal:
0 Disabled
1 Enabled

Default: 1 (Enabled)

Limit: Dec: 0 ≤ m ≤ 1
Hex: 00 ≤ m ≤ 01

Description: This command will store the *low voltage detection* mode option in non-volatile memory.

Notes: When enabled, the low voltage error condition arises if the voltage drops below 19.7V and cleared to 20.8V with 24VDC mechanism**.**
With mechanism 12VDC solution if the voltage drops below 9.0V and cleared to 9.80V.
When disabled, low voltage condition is never checked.
This command must be followed by a reset.

US ETX ô m - [MP]
1F 03 93 m
Set Carriage Return Usage in NVM

Synopsis: Select carriage return usage option in Non-Volatile Memory.

ASCII	US	ETX	ô	m
Hexadecimal	**1F**	**03**	**93**	**m**
Decimal	31	3	*147*	*m*

Operand: m = Select mode

Value Decimal:
0 Used as Print Command
1 Ignored

Default: 1 (Ignored)

Limit: Dec: 0 ≤ m ≤ 1
Hex: 00 ≤ m ≤ 01

Description: This command will store the carriage return usage option in non-volatile memory.

Notes: This option determines how carriage return command is processed.
This command must be followed by a reset.

US ETX ö m - [MP]

1F 03 94 m

Set Lines per Inch Default Setting in NVM

Synopsis:	Select lines per inch setting in Non-Volatile Memory..			
ASCII	US	ETX	ö	M
Hexadecimal	**1F**	**03**	**94**	**M**
Decimal	31	3	*148*	*M*

Operand: m = Select LPI mode

Value Decimal:
0 = 6
1 = 7.52
2 = 8.13

Default: 2 (8.13 Line Per Inch)

Limit:
Dec: 0 ≤ m ≤ 2
Hex: 00 ≤ m ≤ 02

Description: This command will store the lines per Inch default setting option in non-volatile memory.

Notes: This option determines the LPI used after reset.
This command must be followed by a reset.

US ETX ù nL nH - [MP]

1F 03 97 nL nH

Set Additional Size for Search the Mark TOF

Synopsis:	Set additional size for search the Mark Top Of Form and store in Non-Volatile Memory.				
ASCII	US	ETX	ù	nL	nH
Hexadecimal	**1F**	**03**	**97**	**nL**	**nH**
Decimal	31	3	*151*	*nL*	*nH*

Operand: n = Additional size in 1/10 mm.

Formulas: n = (nH*256)+nL

		Decimal	**Hexadecimal**
Default:	100	nL= 100 ; nH = 0	n=64 ; nL= 64 ; nH = 00
	100	1/10mm ➔ 10.0 mm	

Limit:
Dec: 100 ≤ n (1/10mm) ≤ 2550 ➔ 10.0 ≤ n (mm) ≤ 255.0
Hex: 0064 ≤ n ≤ 09F6

Description: The distance additional is in 1/10mm, this distance is stored in NVM.

Note: After issueing the "Feed to TOF" command or when using the paper feed button and also when closing the printer cover. The paper advance is of [1.5 *"Length Ticket defined"+ n] to find the

black mark. This command must be followed by a reset.

US ETX ÿ nL nH - [MP]
1F 03 98 nL nH
Set TOF Mark to Mark distance

Synopsis: This command will store the distance between two TOF (black) marks in non-volatile memory.

ASCII	US	ETX	ÿ	nL	nH
Hexadecimal	**1F**	**03**	**98**	**nL**	**nH**
Decimal	31	3	*152*	*nL*	*nH*

Operand: n = Ticket Length in 1/10 mm.
Formulas: n = (nH*256)+nL

		Decimal	Hexadecimal
Default:	1010	nL= 242 ; nH = 3	n = 3F2 ; nL= F2 ; nH = 03
	1010	1/10mm ➔ 101.0 mm	

Limit: **Dec:** 380 ≤ n (1/10mm) ≤ 2550 ➔ 38.0 ≤ n (mm) ≤ 255.0
Hex: 017C ≤ n ≤ 09F6

Description: This Mark to Mark distance is the ticket length in 1/10mm; this value's stored in NVM.
Note: The distance between two TOF marks selects the maximum distance allowed between two TOF marks. If the next TOF mark is not detected within this distance, a TOF fault is declared. This command must be followed by a reset.

US ETX Ö nL nH - [MP]
1F 03 99 nL nH
Set TOF Mark to Cut distance

Synopsis: Set distance between mark TOF (black) and cutting line, this value is stored it in NVM.

ASCII	US	ETX	Ö	nL	nH
Hexadecimal	**1F**	**03**	**99**	**nL**	**nH**
Decimal	31	3	*153*	*nL*	*nH*

Operand: n = Distance in 1/10 mm.
Formulas: n = (nH*256)+nL

		Decimal	Hexadecimal
Default:	990	nL= 242 ; nH = 3	n = 3DE ; nL= DE ; nH = 03
	990	1/10mm ➔ 99.0 mm	

Limit: **Dec:** 0 ≤ n (1/10mm) ≤ 2550 ➔ 0.0 ≤ n (mm) ≤ 255.0
Hex: 0000 ≤ n ≤ 09F6

Description: The distance between Mark TOF and the cut is in 1/10mm, this value's stored in NVM.
Note: Before actually cutting the paper, the paper is positioned so that the distance between the paper edge and TOF mark matches the desired value.This command must be followed by

a reset.

US ETX Ø m - [MP]
1F 03 9D m
Set USM Count Trigger Mode in NVM

Synopsis: Set USM count trigger mode in Non-Volatile Memory.

ASCII	US	ETX	*Ø*	*m*
Hexadecimal	**1F**	**03**	**9D**	**m**
Decimal	31	3	*157*	*m*

Operand:

m	= Select Mode	
0	Normal	(4 bytes without count)
1	Extended	(5 bytes)

Default: 0 (Normal 4 bytes)

Limit:
Dec: 0 ≤ m ≤ 1
Hex: 00 ≤ m ≤ 01

Description: This command will store the USM count trigger mode option in non-volatile memory.

Notes: This option determines whether position count change can originate USM messages :
In normal mode, position count change doesn't generate USM message.
In extended mode, position count change does generate USM message.
This command must be followed by a reset.
See also command Enable/disable Auto Status Back (1D 61 n).

US ETX í n - [MP]
1F 03 A1 n
Set Voltage Mechanism in NVM

Synopsis: Select voltage mechanism and store in Non-Volatile Memory.

ASCII	US	ETX	*í*	*n*
Hexadecimal	**1F**	**03**	**A1**	**n**
Decimal	31	3	*161*	*n*

Operand:

n	= Select Mode.
0	12 Volts.
1	24 Volts.

Default: 1 24VDC

Limit:
Dec: 0 ≤ n ≤ 1
Hex: 00 ≤ n ≤ 01

Description: This command will store the Voltage Mechanism parameter setting in non-volatile memory.

Notes: Voltage range: components tolerance not taken into consideration.
This command must be followed by a reset.

US ETX ó n - [MP]

1F 03 A2 n

Set Paper introduction Type (Bottom, Top) in NVM

Synopsis:	Set Paper mechanical introduction type in Non-Volatile Memory.			
ASCII	US	ETX	*ó*	*n*
Hexadecimal	**1F**	**03**	**A2**	**n**
Decimal	31	3	*162*	*n*

Operand:	n	= Select Mode
	0	Front for Clamshell Version
	1	Bottom for Autoload Version
Default:	1	(See figure below)
Limit:	Dec:	0 ≤ n ≤ 1
	Hex:	00 ≤ n ≤ 01

Description: This command will store the set paper introduction type selection in non-volatile memory.

Notes: This command must be followed by a reset.

US ETX Ø m - [MP]
1F 03 A5 s dL dH
Set Multi-Heat Mode in NVM

Synopsis: Set and save Multi-Heat mode configuration in Non Volatile Memory.

ASCII	US	ETX	Ø	*s*	*dL*	*dH*
Hexadecimal	**1F**	**03**	**A5**	**s**	**dL**	**dH**
Decimal	31	3	*165*	*s*	*dL*	*dH*

Operand: s = Select Multi-heat Mode.
0 Mode Off.
1 Mode On.
Default: 0 (Multi-heat Mode Off).
Limit: Dec: $0 \leq s \leq 1$
Hex: $00 \leq s \leq 01$

Operands **dL** = Lsb number dots (1 byte).
dH = Msb number dots (1 byte).
Number dots = (dL + (dH * 256))

Limit: Dec: $32 \leq$ **Number dots** ≤ 640
Hex: $20 \leq$ **Number dots** ≤ 0280

Description: This command will store the Multi-Heat mode option and to configure the peak current with the number of dots on in same time in non-volatile memory.

Notes: This command must be followed by a reset.
See also command (1D 25 n dL dH).

Formulas: Current Head (A) = ((Vch/Rhdot)*Number dots)
- Vch = Head Power Supply nominal 24V_{DC} or 12V_{DC}.
- Rdot nominal (24v) = 700Ohm nominal.
- Rdot nominal (12v) = 300Ohm nominal.
- Number Dots = [32; 640].

Example: Rdot = 300 Ohm ; Vch = 14.0V ; Number dots = 55 ➔ Peak current Head = 2.56A

US ETX ª n - [MP]

1F 03 A6 n

Set Paper Autoload Mode in NVM

Synopsis:	Set Paper Autoload Mode on/off and save in Non Volatile Memory.			
ASCII	US	ETX	ª	*n*
Hexadecimal	**1F**	**03**	**A6**	**n**
Decimal	31	3	*166*	*n*

Operand:	n	= Select Paper Autoload Mode.
	0	Mode Off = Disabled.
	1	Mode On = Enabled.
Default:	1	
Limit:	Dec:	0 ≤ n ≤ 1
	Hex:	00 ≤ n ≤ 01

Description: This command will store the set paper autoload selection in non-volatile memory.

Note: This command must be followed by a reset.

US ETX « n - [MP]

1F 03 AE n

Set Paper Low detection Time Out in NVM

Synopsis:	Set paper low detection time out and save in Non Volatile Memory.			
ASCII	US	ETX	«	*n*
Hexadecimal	**1F**	**03**	**AE**	**n**
Decimal	31	3	*174*	*n*

Operand:	n	= Select mode.
	0	= Short time.
	1	= Long time.
Default:	0	(Short time).
Limit:	**Dec:**	0 ≤ n ≤ 1
	Hex:	00 ≤ n ≤ 01

Description: This command will store the paper low time out setting in non-volatile memory.

Note: This command must be followed by a reset.

US ETX ð n - [MP]

1F 03 D0 n

Set error management

ASCII:	US	ETX	ð	*n*
Decimal:	31	3	208	*n*
Hex:	1F	03	D0	*n*

Operand: *n* = error management mode selection

Limit: **Decimal:** $0 \leq n \leq 1$

Hex: $00 \leq n \leq 01$

Description:

This command will store the error management mode selection in non-volatile memory.

Note:

If this mode is not set, the printer blocks the communication when an error is detected. Only real-time commands are accepted (USB or XON/XOFF for RS232) for status reading.
If this mode is set, the communication is not blocked until the Reception buffer is full.

US ETX Ð nL nH - [MP]

1F 03 D1 nL nH

Set Autoload time delay in NVM

Synopsis: Set Paper Autoload Mode on/off and save in Non Volatile Memory.

ASCII	US	ETX	Ð	*nL*	*nH*
Hexadecimal	**1F**	**03**	**D1**	**nL**	**nH**
Decimal	31	3	*209*	*nL*	*nH*

Operand: n = (nL+256*nH) = Select delay (ms)

Default: 0 Use the command “Set Autoload Step”.

Limit: Dec: $0 \leq n \leq 5000$

Hex: $0000 \leq n \leq 1388$

Description: This command will store the *set autoload delay* selection in non-volatile memory.

Note: See “Set Autoload Step” command (1F 0A 9D nL nH).
This command must be followed by a reset.

US ETX Ê nL nH - [MP]
1F 03 D2 nL nH
Set Sensor TOF to Cut Distance in NVM

Synopsis: Set distance between sensor TOF and cutting line, this value is stored it in NVM.

ASCII	US	ETX	Ê	nL	nH
Hexadecimal	**1F**	**03**	**D2**	**nL**	**nH**
Decimal	31	3	*210*	*nL*	*nH*

Operand: n = Distance in 1/10 mm.
Formulas: n = (nH*256)+nL

		Decimal	Hexadecimal
Default:	260	nL= 4 ; nH = 1	n = 0104 ; nL= 04 ; nH = 01
	260	1/10mm ➔ 26.0 mm	

Limit: Dec: n (1/10mm) ≤ 2550 ➔ n (mm) ≤ 255.0
Hex: n ≤ 09F6

Description: The distance is in 1/10mm, this value's stored in NVM.
Note: Change this value if you use an external mechanism sensor (Example: J7 – Low paper sensor), set your new distance with your product. This command must be followed by a reset. This command must be followed by a reset.
Contact your vendor for more information.

US ETX Ë n - [MP]
1F 03 D3 n
Select or Cancel Driver Easy Mode in NVM

Synopsis: Select or cancel and save Driver Easy Mode in Non Volatile Memory.

ASCII	US	ETX	Ë	*n*
Hexadecimal	**1F**	**03**	**D3**	**n**
Decimal	31	3	*211*	*n*

Operand: n = Select Driver Easy Mode.
0 Mode disabled.
1 Mode Enabled.
Default: 0 (Driver Easy Mode disabled).
Limit: Dec: 0 ≤ n ≤ 1
Hex: 00 ≤ n ≤ 01

Description: Driver Easy Mode Enabled :
The real time commands are available on the Bulk Out (Received data printer) End Point.
And real time commands replies are available on the Bulk IN (transmit data to host) End Point.

Note: This command must be followed by a reset.

All data (Graphics data, text data …) received on the Bulk Out are interpreted and tested in real time ommands!

See also USM Command; automatic reply on the Bulk In (transmit data to host), Code (1D 61 n).

US ETX Î nL nH - [MP]

1F 03 D7 nL nH

Set TOF Offset Cut and select Paper Saving Mode in NVM

Synopsis: Select an offset of cut position and selected the Paper Saving Mode, these parameters is stored it in NVM.

ASCII	US	ETX	Î	nL	nH
Hexadecimal	**1F**	**03**	**D7**	**nL**	**nH**
Decimal	31	3	*215*	*nL*	*nH*

Operand: **n** = Distance in 1/10 mm.

Formulas: **n** = (nH*256) + nL with nH only bit6 to bit0.

nH Bit7 selected Paper Saving Mode (see Table below).

		Decimal	Hexadecimal
Default n:	0	nL= 0 ; nH = 0	n = 0000 ; nL= 00 ; nH = 00
	0	1/10mm ➔ 0.0 mm	
Limit:	Dec:	n (1/10mm) ≤ 2550	➔ n (mm) ≤ 255.0
	Hex:	n ≤ 09F6	

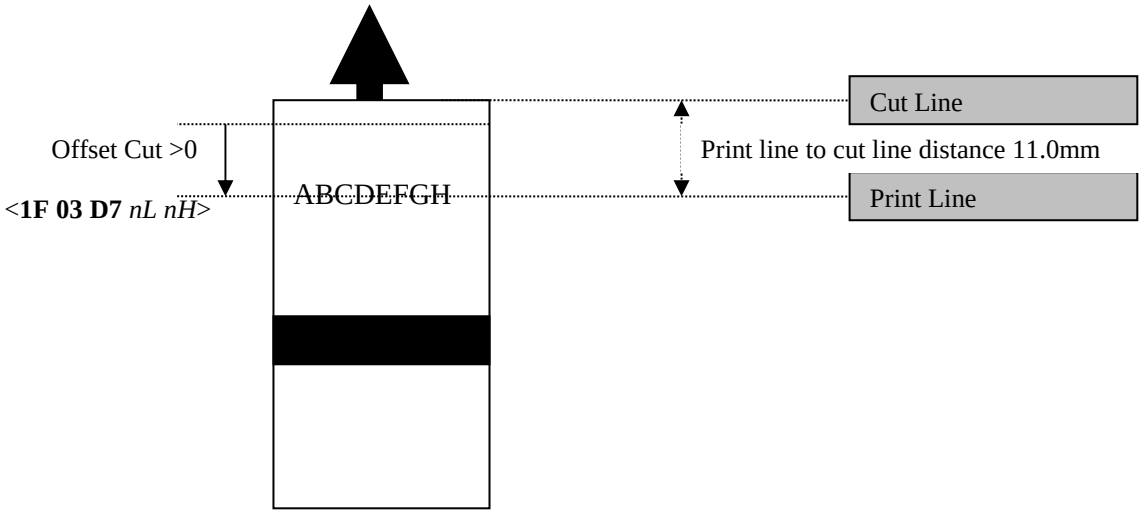
Description: The distance is in 1/10mm and Paper saving mode, these values are stored in NVM.

The Economy mode allows paper to manage the automatic positioning of the paper receipt of the cut command. The difference between mode 1 and 2. Mode 2 in the same position paper after the receipt of a command "Form Feed" or "Form feed + cut". Mode 2 allows for group tickets. This is not the case of mode 1.

Note: When the mode is activated paper economy. Directory you can reduce the distance between the start of printing and the cutting line. Standard on / built CM RM distance is 11 mm. If you adjust offset cut to 8mm. The beginning of the printing line is cut to 3mm

This command must be followed by a reset.

Offset Cut / **Paper saving Mode**	**= 0** **Off**		**>0** **On**	
Bit7 nH / **Received Command Cut <19>:**	**= 0** **Mode 1**	**= 1** **Mode 2**	**= 0** **Mode 1**	**= 1** **Mode 2**
Before cut move Paper “Offset cut” distance	No	No	No	Yes
Cut paper	Yes	Yes	Yes	Yes
After cut move reverse paper “Offset cut” distance	No	No	Yes	Yes



US ETX ┌ n - [BP] [MP]
1F 03 DA n
Set Reset Sequence "to go Maintenance Mode" / "to Print Self test" (NVM)

Synopsis: Select reset sequence to enter in Maintenance Mode and store in Non Volatile Memory.

ASCII	US	ETX	┌	*n*
Hexadecimal	**1F**	**03**	**DA**	**n**
Decimal	31	3	*218*	*n*

Operand:
- n = Select sequence Maintenance mode.
- 0 Press and hold paper Feed button and press and then released reset Button.
- 1 Powering the printer up and press and hold paper Feed button.

Default: 0

Limit:
- Dec: 0 ≤ n ≤ 1
- Hex: 00 ≤ n ≤ 01

Description: Set Reset sequence to enter in Maintenance Mode and save it in NVM.
Or in opposition, set reset sequence to print a Self test.

Note: This command must be followed by a reset.
The Reset sequence (Hardware or software) not used for enter in maintenance mode is used in main program to print a self test or diagnostic ticket (see command 1F 03 DB).

US ETX ▮ n - [MP]
1F 03 DB n
Select Ticket Form for Start-up diagnostics in NVM

Synopsis:	Select ticket type for Start-up diagnostic and store in Non Volatile Memory.			
ASCII	US	ETX	▮	*n*
Hexadecimal	**1F**	**03**	**DB**	**n**
Decimal	31	3	*219*	*n*

Operand:	n	= Select Ticket.
	0	Selft test ticket.
	1	Diagnostics Form ticket.
Default:	0	
Limit:	Dec:	$0 \leq n \leq 1$
	Hex:	$00 \leq n \leq 01$

Description: This command will store the start-up ticket form selection in non-volatile memory.
Note: This command must be followed by a reset.

US ETX ▄ n - [MP]
1F 03 DC n
Set Default print speed for raster graphic 11H in NVM

Synopsis:	Select Max. print speed for raster graphic 11H command and store in Non Volatile Memory.			
ASCII	US	ETX	▄	*n*
Hexadecimal	**1F**	**03**	**DC**	**n**
Decimal	31	3	*220*	*n*

Operand:	n	= Select Maximum speed in mm/s.
Default::	250	
Limit:	Dec:	$35 \leq n \leq 255$
	Hex:	$23 \leq n \leq FF$

Description: This command will store the *Maximum speed raster graphic 11H* in non-volatile memory.
Note: This command must be followed by a reset.

US ETX ¦ n - [MP]

1F 03 DD n

Set Default Maximum print speed for specific Bar code in NVM

Synopsis:	Select Max. print speed for specific print Bar Code and store in Non Volatile Memory.			
ASCII	US	ETX	¦	*n*
Hexadecimal	**1F**	**03**	**DD**	**n**
Decimal	31	3	*221*	*n*

Operand:	n	= Select Maximum speed in mm/s.
Default::	50	
Limit:	Dec:	35 ≤ n ≤ 255
	Hex:	23 ≤ n ≤ FF

Description: This command will store the *Maximum speed for specific print bar code* in non-volatile memory.

Specific bar code : Bar code 2D , rotate 90° print bar code, …

Note: This command must be followed by a reset.

US ENQ n - [MP]

1F 05 n

Select Superscript or Subscript Modes

Synopsis:	Select superscript or subscript mode (on/off).		
ASCII	US	ENQ	*n*
Hexadecimal	**1F**	**05**	**n**
Decimal	31	5	*n*

Operand:	n	= Select Size Mode
	0	Normal character size.
	1	Select subscript size.
	2	Select superscript size.
Default:	0	(Normal size)
Limit:	Dec:	0 ≤ n ≤ 2
	Hex:	00 ≤ n ≤ 02

Description: Turns superscript or subscript modes on or off. This attribute may be combined with other characters size settings commands (12, 13, 1B 21 n, 1D 21 n, …)

Note: This command is ignored if n is out of the specified range.

US BEL n - [MP]
1F 07 n
Read Configuration Setting (NVM)

Synopsis: Read configuration setting in Non-Volatile Memory.

ASCII	US	BEL	*n*
Hexadecimal	**1F**	**07**	**n**
Decimal	31	5	*n*

Operand: n = Header byte
Limit: See table below.

Reply bytes
(1) Header byte = n
(2) Configuration Setting made of one or more bytes, and using the same values as in the command used to set those parameters.

Description: Reply configuration setting (see table below).
Note: This command is ignored if n is out of the specified range.
Example: Command (1F 07 80) returns the default code page.
If the current paper type setting is “CP437 ”, the returned string would be 80 00
80 as header byte for command 1F 07 80,
00 as seen in parameter table for command 1F 03 80

n (HEX)	Read Setting	See Command (Hexadecimal)
00	Read Set Diagnostics mode	1F 03 00
02	Read Knife Option	1F 03 02
03	Read Paper Low Mode	1F 03 03
04	Read Max Power	1F 03 04
08	Read Paper width	1F 03 08
0A	Read Partial Cut Distance	1F 03 0A
0B	Read preheating Option	1F 03 0B
0F	Read Set Default Font	1F 03 0F
10	Read Communication selected	1F 02 …
13	Read Sensor Assignation	1F 03 13
1A	Read Power Supply Coefficient	1F 0A 10 …
46	Read Max Print Speed	1F 0C 53 50 46
4A	Read Print Density	1F 0B 4E 52 4A
55	Read User Flash mapping	1D 22 55 …
73	Read Sensor Threshold. (1) [Id]	1D 73 …
77	Read Set Watchdog Mode	1F 0A 77
80	Read Set default code page	1F 03 80
82	Read Minimum Receipt Length	1F 03 82
87	Read Top Of Form Option	1F 03 87
88	Read Paper Jam Option	1F 03 88

(1) An additional parameter is required for sensor

n (HEX)	Read Setting	See Command (Hexadecimal)
89	Read Set Cover sensor Option	1F 03 89
8A	Read Packet Protocol Option	1F 03 8A
8B	Read Mechanism Type (0x18)	1F 03 8B
8E	Read Offset start TOF Mark	1F 03 8E …
8F	Read Paper Type	1F 03 8F
90	Read Fault Recovery	1F 03 90
91	Read Low votage detection	1F 03 91
93	Read Carriage Return Usage	1F 03 93
94	Read Default LPI	1F 03 94
97	Read Additional size to search Mark (2)	1F 03 97 …
98	Read Mark to Mark or Ticket Length (2)	1F 03 98 …
99	Read Mark to cut Distance TOF (2)	1F 03 99 …
9D	Read USM Count Mode	1F 03 9D
A1	Read Voltage Board	1F 03 A1
A2	Read Paper Introduction	1F 03 A2
A5	Read Multi-heat Mode	1F 03 A5
A6	Read AutoLoad Mode	1F 03 A6
AE	Read Paper Low Time Out	1F 03 AE
B0	Read Holding Time Motor	1F 03 B0
D1	Read Time AutoLoad	1F 03 D1
D2	Read Sensor to Cut Line Distance (2)	1F 03 D2 …
D3	Read Driver Easy Mode	1F 03 D3
D7	Read Offset Cut / TOF Saving (2)	1F 03 D7 …
DA	Read Reset setting. Init. Self ticket	1F 03 DA
DB	Read Select Self mode Ticket	1F 03 DB
DC	Read Max. speed Raster graphic 11	1F 03 DC
DD	Read Max. speed specific Bar code	1F 03 DD

US BS n - [BP]

1F 08 n

Set Boot Size

Synopsis:	Set Boot size.		
ASCII	US	BS	*n*
Hexadecimal	**1F**	**08**	**n**
Decimal	31	8	*n*
Operand:	n	= New Size Boot	
Formulas:	Size	= n*1024 bytes	
Default:	36	(Current size)	
Limit:	Dec:	0 ≤ n ≤ 255	
	Hex:	00 ≤ n ≤ FF	
Description:	Set new boot loader size.		
	Select Boot sector erase.		
Note:	Available only in download mode.		

US HT d1…dn - [BP]

1F 09 d1…dn

Erase Boot Sector + Download new Boot code with Reply Information

Synopsis: Erase boot sector and download new boot code with reply information.

ASCII	US	HT	*d1…dn*
Hexadecimal	**1F**	**09**	**d1…dn**
Decimal	31	9	*d1…dn*

Value and range

n = 36864 (Actual Boot Loader size 36Ko)

n = 6144 (Actual Boot Strap size 6Ko)

Reply byte:

(1) Received data → Reply byte = 1

(2) Check received data → Reply byte = ACK or NAK

(3) Erase + Downloaded data → Reply byte = 2

(4) Check download data → Reply byte = ACK or NAK

ASCII:	ACK	: OK
	NACK	: NOK
Hex:	06	: OK
	15	: Fault

Description: Wait for new boot code to be downloaded, then check CRC on this new boot code, and if valid, boot code sector is erased and reprogrammed with new code. Printer automatically reboots after program sequence is complete (Boot = Boot Strap + Boot Loader).

Note : Available only in download mode. During erase and download sequence, power supply must be maintained at all times and no reset sequence should be performed. (See also command 1F 01 …)

US LF ENQ n NUL NUL – [MP] [DBG]
1F 0A 05 n 00 00
Read PWM Current Value

Synopsis: Read current PWM Value.

ASCII	US	VT	*ENQ*	*n*	*00*	*00*
Hexadecimal	**1F**	**0A**	**05**	**n**	**00**	**00**
Decimal	31	10	*5*	*n*	*0*	*0*

Operand: **n** = Select PWM.

Operand n

Ascii	Hex	Dec	PWM function
"T"	54	84	Top Of Form sensor (J6 connector).
"P"	50	80	Paper Feed Motor.
"C"	43	67	Knife/Cutter Motor.
"A"	41	65	Auxilliary Motor.

Reply: « r=xx ; p=yyyy ACK »
r = Rapport cyclic (1 byte).
p = Period in µS (2 bytes).
ACK = 0x06

Description: Returns the value of PWM.

US LF ENQ s n m - [MP] [DBG]
1F 0A 05 s n m
Write PWM a Value in Volatile Memory

Synopsis: Write current PWM Value in Volatile Memory (SRAM).

ASCII	US	VT	*ENQ*	*s*	*n*	*m*
Hexadecimal	**1F**	**0A**	**05**	**s**	**n**	**m**
Decimal	31	10	*5*	*s*	*n*	*m*

Operand: s = Select PWM.

Operand s

Ascii	Hex	Dec	PWM function
"T"	54	84	Top Of Form sensor (J6 connector).
"P"	50	80	Paper Feed Motor.
"C"	43	67	Knife/Cutter Motor.
"A"	41	65	Auxilliary Motor.

Operand: n = Rapport Cyclic.
Default 12
Limit: Dec: 00 ≤ *n* ≤ m+1
Hex: 00≤ *n* ≤ m+1

Operand: m = period (in µs).
Default 33
Limit: Dec: 00 ≤ *n* ≤ 255
Hex: 00≤ *n* ≤ FF

Description: Set register PWM TOF sensor or Motor values.
Note : Period default 120 µS for motors and 100 µS for sensors.
After reset this parameters values is lost! Restore default value of NVM.

US LF DLE n - [MP] [DBG]
1F 0A 10 n
Set Power Supply coefficient in NVM

Synopsis: Power supply coefficient.

ASCII	US	LF	*DLE*	*n*
Hexadecimal	**1F**	**0A**	**10**	**n**
Decimal	31	10	16	n

Operand :	**Hexadecimal**	**Decimal**
Value of n:	01 ≤ n ≤ FF	1 ≤ n ≤ 255
Default :	28	**40%**

Description: Percentage of parameters for power supply.
Note: This command must be followed by a reset.

US LF M D *s* *l* Data[0]…[n] - [MP]
1F 0A 4D 44 s l Data[0]…[n]
Download External Module

Synopsis: Download external module in Flash Memory User.

ASCII	US	LF	M	D	*s*	*l*	
Hexadecimal	**1F**	**0A**	**4D**	**44**	**s**	**l**	**Data[0]…[n]**
Decimal	31	10	77	68	*s*	*l*	

Operands :	**Hexadecimal**	**Decimal**	**Ascii**	
Value of s:	31 ≤ s ≤ 33	49 ≤ s ≤ 51	‘1’	= Logo/fonts sector storage.
			‘2’	= User Data sector storage.
			‘3’	= EasyFont sector storage.
Value of l:	01	1	SOH	= Size of Data file modulo 64Kbytes.
Formulas:	n = (l*64*1024)-1			

Description: Download executable code to user flash memory.

Note: During download “*file.pmd*”, reply Informations status:

- 07 = Erase data section *s* (automatic).
- 06 = Acknowledge *x* data block.
- 329E *End download* = CRC value, 2 bytes, download Ok.
- 15 *If error* = No Acknowledge, error download, error sector allocation….

US LF R = n - [BP]

1F 0A 52 3D *n*

Set Rx Buffer Size in NVM

Synopsis: Change size value of Rx Buffer and store value in Non-Volatile Memory.

ASCII	US	LF	R	=	n
Hexadecimal	**1F**	**0A**	**52**	**3D**	**n**
Decimal	31	10	82	61	n

Operand :

Value of n:

Hexadecimal	Decimal	Value n in Kbytes
04	4	4
08	8	8
0F	16	16
18	24	24

Default : 04 4 (4 Kbytes = 4096 bytes).

Formulas : (n Kbytes * 1024) = Number Bytes.

Description: Set Rx Buffer Size in Kbytes and store value (increase or decrease SRAM memory User).

See “RX Buffer size” in Diagnostic form.

Rx buffer is the reception buffer of data RS232 interface.

Rx buffer is the Bulk Out end point for USB interface.

Note:

(1) **This command is processed only in boot mode. If the printer is running in normal mode, send first command “switch to Boot Mode” (1B 5B 7D).**

(2) **This command must be followed by “Printer Reset” command (1D FF).**

US LF M D - [MP]

1F 0A 52 4D 44

Reply Status External Module

Synopsis:	Read current informations for the External Module.				
ASCII	US	LF	R	M	D
Hexadecimal	**1F**	**0A**	**52**	**4D**	**44**
Decimal	31	10	82	77	68

Reply data: ***No module in Memory:***

Module= Off	→Module no downloaded.
Revision= 1.00	→Revision Module Control
ACK	→Operation Ok (06).

Reply data: ***With module in Memory:***

Module= On	→Module downloaded.
User Memory Storage= 1	→User data Storage.
Type = MBC2	→Name.
Version= 00.01	→Version.
CRC= 329E	→CRC.
ACK	→Operation Ok (06).

US LF c=P;r=n;p=m - [MP][DBG]
1F 0A 63 3D 50 3B 72 3D n 3B 70 3D m
Write PWM Sensor Value to NVM.

Synopsis: Write PWM J6 sensor value and store to Non Volatile Memory.

ASCII	US	LF	c	=	P	;	r	=		;	p	=	
Hexadecimal	**1F**	**0A**	**63**	**3D**	**50**	**3B**	**72**	**3D**	*n*	**3B**	**70**	**3D**	*m*
Decimal	31	10	99	61	80	59	114	61		59	112	61	

Operand	Decimal	Hexadecimal	Description
Values of Op:	00 to 255	**00 to FF**	***n = Rapport Sensor (Ton).***
	00 to 255	**00 to FF**	***m = Period (Ton+Toff).***

Description: This command will store the *PWM J6 Sensor* selection in non-volatile memory.
On standard Board, J6 Sensor Connector = End Paper Sensor and also Top of form Sensor in option.

Note: This command must be followed by a reset.

US LF I = n1 n2 - [BP][MP]
1F 0A 6C 3D n1 n2
Read Layers Information

Synopsis: Read layers information (CRC and version).

ASCII	US	LF	I	=	*n1*	*n2*
Hexadecimal	**1F**	**0A**	**6C**	**3D**	**n1**	**n2**
Decimal	31	10	108	61	*n1*	*n2*

- (n1 n2) ←→ parameters = Select layer (2 bytes)

Operand	ASCII	Hexadecimal	Description
Values of Op:	BS	**42 53**	- Read information Boot Strap layer.
	BL	**42 4C**	- Read information Boot Loader layer.
	CL	**43 4C**	- Read information Client or main application layer.

Description: Reply layer CRC (CCCC) and version number (v.vv) and terminated character ACK (= 06)
Reply format : BS = CCCC ; v.vv ACK or BL = CCCC ; v.vv ACK or CL = CCCC ; v.vv ACK
If command error return NAK = 0x15.

Note: If main application,Client is absent reply format : CL = DEAD ; x.xx ACK

US LF l = n - [MP] [DBG]
1F 0A 74 3D n
Read Com Port specific Information

Synopsis: Read Com port specific information.

ASCII	US	LF	t	=	*n*
Hexadecimal	**1F**	**0A**	**74**	**3D**	**n**
Decimal	31	10	116	61	*n*

Operand :	**ASCII**	**Hexadecimal**	**Description**
Value of n:	D	**44**	- Read Diagnostic Form.
	E	**45**	- Read Heating table.
	P	**50**	- Read PWM motors information (see table below).
	V	**56**	- Get current ticket speed.

Description: Read Com port (= USB, RS232) information.

***n* = 50 Read Pwm Motors information:**

ASCII	US	LF	T	=	*50*	*Id*	*p*
Hexadecimal	**1F**	**0A**	**74**	**3D**	**50**	**Id**	**p**
Decimal	31	10	116	61	*50*	*Id*	*P*

Operand *Id* :	**ASCII**	**Hexadecimal**	**Description**
	P	50	- motor Paper advance.
	C	43	- motor Cutter.
	A	41	- motor Auxilliary.

Operand *p* :	**ASCII**	**Hexadecimal**	**Description**
	V	56	- Vref motor (V).
	I	49	- Max. Current motor (mA)
	C	43	- A/D value [0,255].

US LF w = n - [BP] [DBG]
1F 0A 77 3D n
Set or Reset Watchdog in NVM

Synopsis: Turn on/off watchdog.

ASCII	US	LF	w	=	*n*
Hexadecimal	**1F**	**0A**	**77**	**3D**	**n**
Decimal	31	10	119	61	*n*

Operand :	**ASCII**	**Hexadecimal**	**Description**
Value of n:	N	**4E**	Watchdog Off.
	Y	**59**	Watchdog On (Default).

Description: This command will store the *watchdog* option in non-volatile memory.

Notes:
1. This command is processed only in boot mode. If the printer is running in normal mode, send first command “switch to Boot Mode” (1B 5B 7D).
2. This command must be followed by “Printer Reset” command (1D FF).

US LF n - [MP]
1F 0A n (= 84, 85)
Voltage and Temperature Monitoring

Synopsis: Voltage and temperature monitoring.

ASCII	US	LF	*n*
Hexadecimal	**1F**	**0A**	**n**
Decimal	31	10	*n*

Operand : **n** = select reply type
Limits: Dec: $132 \leq n \leq 133$
Hexa: $84 \leq n \leq 85$

Return : Always returns 7 Bytes (see tables below)
Command ID + zero terminated ASCII string.

Description: Returns the results of latest voltage and temperature measurements.See comands below.

RETURNED STATUS DEFINITION *n* = 0x84: Read Voltage (in Volt)		
Byte	**Function**	**Value**
0	Command Id	0x84
1-5	ASCII string	…
6	End of String	0x00

RETURNED STATUS DEFINITION *n* = 0x85: Read Print head Temperature (in °C)		
Byte	**Function**	**Value**
0	Command Id	0x85
1-5	ASCII string	…
6	End of String	0x00

US LF è - [MP] [DBG]

1F 0A 8A

Print Heating Time Table

Synopsis:	Print heating time table.		
ASCII	US	LF	è
Hexadecimal	**1F**	**0A**	**8A**
Decimal	31	10	138

Description: Print heating time table.

US LF ï - [MP] [DBG]

1F 0A 8B n

Set GFX Print Area Width

Synopsis:	Set GFX print area width.			
ASCII	US	LF	ï	*n*
Hexadecimal	**1F**	**0A**	**8B**	**n**
Decimal	31	10	139	*n*

Operand : **n** = select width

Default Dec: 80

Limits: Dec: $1 \leq n \leq 80$

Hexa : $01 \leq n \leq 50$

Description: Set graphic print area width. See graphics code (11).

US LF ù l m - [MP] [DBG]

1F 0A 97 l m

Save Current (mA) Knife Motor in NVM

Synopsis:	Set current knife motor value, and save it in NVM.				
ASCII	US	LF	Ù	l	m
Hexadecimal	**1F**	**0A**	**97**	**l**	**m**
Decimal	31	10	151	l	m

Operands: l = LSB value of c.

m = MSB value of c.

Formulas: c = ((mx256) + l) Current c in mA.

Limits: Dec: $250 \leq c \leq 1000$

Hexa : $0FA \leq c \leq 3E8$

Description: This command will store the *Knife Motor current* value in non-volatile memory.

Note: This command must be followed by a reset.

US LF ÿ - [MP] [DBG]
1F 0A 98
Read Current Knife Motor in NVM

Synopsis:	Read current paper feed motor value.		
ASCII	US	LF	Ÿ
Hexadecimal	**1F**	**0A**	**98**
Decimal	31	10	152
Reply:	2 bytes = b0 b1 (LSB MSB)		
Formulas:	(b0+b1x256) = Current mA.		
Description:	Read Current (mA) for Knife motor.		
Example:	Hexadecimal value byte0 = F4 and byte1 = 01 ➔ Decimal value Current = 500 mA.		

US LF Ü l m - [MP] [DBG]
1F 0A 9A l m
Save Current (mA) Paper Feed Motor in NVM

Synopsis:	Set current paper feed motor value in NVM.				
ASCII	US	LF	Ü	l	m
Hexadecimal	**1F**	**0A**	**9A**	**l**	**m**
Decimal	31	10	154	l	m
Operands:	l = LSB value of c.				
	m = MSB value of c.				
Formulas:	c = ((mx256) + l) Current c in mA.				
Limits:	Dec: 250 ≤ *c* ≤ 1000				
	Hexa : 0FA ≤ *c* ≤ 3E8				
Description:	This command will store the *Paper Feed Motor current* value in non-volatile memory.				
Note:	This command must be followed by a reset.				

US LF ø - [MP] [DBG]
1F 0A 9B
Read Current Paper Feed Motor in NVM

Synopsis:	Read current paper feed motor value.		
ASCII	US	LF	ø
Hexadecimal	**1F**	**0A**	**9B**
Decimal	31	10	155
Reply:	2 bytes = b0 b1 (LSB MSB)		
Formulas:	(b0+b1x256) = Current mA.		
Description:	Read Current (mA) paper feed motor.		
Example:	Hexadecimal value byte0 = F4 and byte1 = 01 ➔ Decimal value Current = 500 mA.		

US LF Ø nL nH - [MP] [DBG]
1F 0A 9D nL nH
Set Autoload steps number in NVM

Synopsis:	Select number steps for autoload insertion and store value in Non Volatile Memory.				
ASCII	US	LF	Ø	nL	nH
Hexadecimal	**1F**	**0A**	**9D**	**nL**	**nH**
Decimal	31	10	157	nL	nH
Operands:	n	Number steps.			
Formulas:	n	= (nL+256*nH)		nL = LSB of n ; nH= MSB of n.	
Limits:	Dec:	400 ≤ *n* ≤ 3200			
	Hexa:	0190 ≤ *n* ≤ 0C80			
Default value:	Dec:	800			
	Hexa:	0320	(nL=20 ; nH=03)		
Description:	This command will store the A*utoload steps number* in non-volatile memory.				
Note:	This command must be followed by a reset. Paper Feed speed 50mm/s. 800 motor steps ➔ 100 mm paper (3.94 inch) ➔ Time insertion = ~2 seconds. 1200 motor steps ➔ 150 mm paper (5.90 inch) ➔ Time insertion = ~3 seconds.				

US LF × - [MP] [DBG]

1F 0A 9E

Read Autoload steps number

Synopsis:	Read current Autoload steps number value.		
ASCII	US	LF	×
Hexadecimal	**1F**	**0A**	**9E**
Decimal	31	10	158
Reply:	2 bytes	= nL nH (LSB MSB)	
Formulas:	(nL+nHx256) = n Number steps.		
Description:	Read Number steps feed motor for autoload paper insertion.		
Example:	Hexadecimal value byte0 nL = 00 and byte1 nH= 04 ➔ Decimal value = 1024 steps motor = 124mm.		

US LF ▒ n – [MP]

1F 0A B0 n

Set Hold Motor Mode in NVM

Synopsis:	Set hold paper feed motor mode, set time in second and save in NVM.			
ASCII	US	LF	▒	n
Hexadecimal	**1F**	**0A**	**BO**	**n**
Decimal	31	10	176	n
Operand:	n	= 00 Disable Hold motor mode.		
		> 00 Enabled hold motor mode, during n second.		
Limit:	Dec:	$0 \leq n \leq 60$		
	Hex:	$00 \leq n \leq 3C$		
Default:	n	= 00 (Disabled)		
Description:	This command will store the *Hold motor mode* value in non-volatile memory.			
	Hold motor trigger is partial cut command (1A, …).			
Note:	This command must be followed by a reset.			

US VT N R J n - [MP]
1F 0B 4E 52 4A n
Set Print Density in NVM

Synopsis: Set print density (NVM).

ASCII	US	VT	*N*	*R*	*J*	*n*
Hexadecimal	**1F**	**0B**	**4E**	**52**	**4A**	**n**
Decimal	31	11	*78*	*82*	*74*	*n*

Operand: n = Percentage of the nominal heating time value.
Default 100 %

Limit: Dec: $80 \leq n \leq 120$
Hex: $50 \leq n \leq 78$

Description: Set the print density (energy applied to paper) in percent relative to nominal energy.
This command will store the *print density* value in non-volatile memory.

Note : This command must be followed by a reset.

WARNINGS!!

- **Choose a print density setting no higher than necessary to achieve acceptable print density.**
- **Failure to observe this rule may result in a printer service call.**
- **Failure to observe this rule may void the printer warranty.**
- **Consult your AXIOHM technical support specialist if you have questions.**

US FF S P B n - [MP]
1F 0C 53 50 45 nL nH
Set Maximum Speed for Raster graphic 11H command

Synopsis: Select the maximum speed for raster graphic 11H.

ASCII	US	FF	S	P	B	*nL*	*nH*
Hexadecimal	**1F**	**0C**	**53**	**50**	**45**	**nL**	**nH**
Decimal	31	12	83	83	66	*nL*	*nH*

Operand: n = (nL+256xnH) = Select speed raster graphic 11h (mm/s).
Default Dec: 250

Limit: Dec: $35 \leq n \leq 250$
Hex: $0023 \leq n \leq 00FA$ (nL=FA ; nH=00)

Description : Sets the maximum printer peak speed. This maximum speed is typically reached at low dot coverage.
Actual print speed decreases when dot coverage increases.
This command will be set before print the image in *raster graphic 11h.*

Notes: See also <1F 03 DC n> command, set default start value.
The <1F 0C 53 50 **46** *nL nH*> command set the maximum global print speed for the printer!

US FF S P F n - [MP]
1F 0C 53 50 46 nL nH
Set Maximum Speed in NVM

Synopsis: Select the maximum speed value and store in Non Volatile Memory.

ASCII	US	FF	S	P	F	*nL*	*nH*
Hexadecimal	**1F**	**0C**	**53**	**50**	**46**	**nL**	**nH**
Decimal	31	12	83	83	65	*nL*	*nH*

Operand: n = (nL+256xnH) = Select speed (mm/s)

Default Dec: 250

Limit: Dec: $50 \leq n \leq 250$

Hex: $001E \leq n \leq 00FA$ (nL=FA ; nH=00)

Description: Sets the maximum printer peak speed. This maximum speed is typically reached at low dot coverage. Actual print speed decreases when dot coverage increases.
This command will store the *Maximum speed* value in non-volatile memory.

Notes: This command must be followed by a reset.
With CM-RM Premium 24VDC mechanism the maximum speed is 250mm/s.
With CM-RM Premium 12VDC mechanism the maximum speed is 150mm/s.
With CM-RM Premium thick Paper 12VDC mechanism the maximum speed is 100mm/s.

US FF S A F n - [BP]
1F 0C 53 41 46 n
Boot Safety Mode

Synopsis: Set/Reset Boot safety mode.

ASCII	US	FF	S	A	F	*n*
Hexadecimal	**1F**	**0C**	**53**	**41**	**46**	**n**
Decimal	31	12	83	65	70	*n*

Operand: n = 00 Disabled safety mode
= 01 Enabled safety mode

Limit: Dec: $0 \leq n \leq 1$
Hex: $00 \leq n \leq 01$

Default: n = 01 Enabled

Description: Disable or enable safety mode for Boot download.

US CR C L E n - [BP]
1F 0D 43 4C 45 n
Reset Non-Volatile-Memory parameters

Synopsis: Reset NVM parameters.

ASCII	US	CR	*C*	*L*	*E*	*n*
Hexadecimal	**1F**	**0D**	**43**	**4C**	**45**	**n**
Decimal	31	13	*67*	*76*	*69*	*n*

Operand: n = Security byte

Limit Dec: n = 0
Hex: n = 00

Description: This command will reset the non-volatile memory configuration items to their default values.
Followed by reboot printer.

Note : This command is processed only in boot mode.
If the printer is running in main program mode, send first command “switch to Boot Mode” (1B 5B 7D).

US CR D U M - [MP] [DBG]
1F 0D 44 55 4D
Dump Non-Volatile-Memory parameters

Synopsis: Dump NVM parameters.

ASCII	US	CR	*D*	*U*	*M*
Hexadecimal	**1F**	**0D**	**44**	**55**	**4D**
Decimal	31	13	*68*	*85*	*77*

Limit Dec: 0 ≤ *Identify* ≤ 255
Hex: 00 ≤ *Identify* ≤ FF

Description: This command is a dump of non-volatile-memory.
If parameter defined: Syntax = *Separator* (hexadecimal value = FF), *Identify*, *size (byte number)*, *Value*.
If parameter no defined: Syntax = *Separator* (hexadecimal value = FF), *Identify.*

Example: FF 00 04 BA AA 00 00 FF 01 FF 02 …
➔ FF = separator, Identify = 00, Size = 04 Bytes, Value = BA AA 00 00,
➔ FF = separator, Identify = 01, (no defined)
➔ FF = separator, …

US SO SOH nL nH - [MP]

1F 0E 01 nL nH

Set Partial Cut Distance in NVM

Synopsis:	Select partial cut distance value and save in Non-Volatile Memory.				
ASCII	US	SO	SOH	nL	nH
Hexadecimal	**1F**	**0E**	**01**	**nL**	**nH**
Decimal	31	14	*1*	*nL*	*nH*

Operand:	n	= (nL+256*nH) Knife motor steps
Limit	Dec:	100 ≤ n ≤ 1280
	Hex:	64 ≤ n ≤ 0500
Default:	130	

Description: This command will store the *partial cut distance* parameter in non-volatile memory.

Note: This setting must be set to match the mechanism connected to the board, in order to get partial cut position matching the knife notch.

This setting is used to compensate for mechanical tolerances on parts involved in knife operation.

This command must be followed by a reset.

There are two codes for this function, see also command Set Partial Cut Distance (1F 03 0A n).

US & H cn cm ln [dnk] … lm [dmk] - [MP]
1F 26 H cn cm ln [dnk] … lm [dmk]
Define User-Defined Character Set with Variables Height

Synopsis: Define User-Defined character set with variables height.

ASCII	US	&	*H*	*cn*	*cm*	*ln*	*[dn1 … dnk]*	…	*Lm*	*[dm1 … dmk]*
Hexadecimal	**1F**	**26**	**H**	**cn**	**cm**	**ln**	**[dn1… dnk]**	**…**	**lm**	**[dm1… dmk]**
Decimal	31	38	*H*	*cn*	*cm*	*ln*	*[dn1 … dnk]*	…	*lm*	*[dm1 … dmk]*

Value of range:

H

Parameter H indicates character height in number of dots, and does not have to be dividable by 8.

From 1 to 8 dots high => 1 data byte per

From 9 to 16 dots high => 2 data bytes per column

From 17 to 24 dots high => 3 data bytes per column

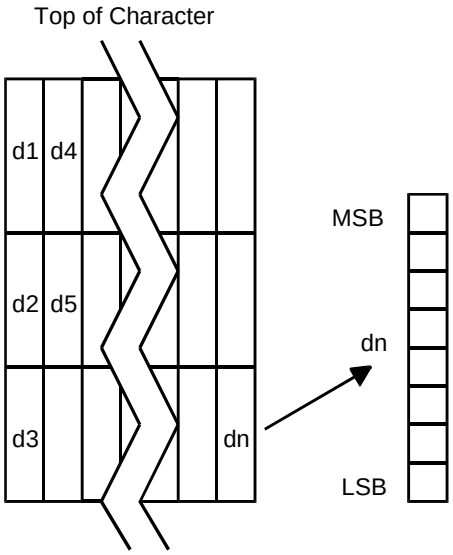
Etc…

Description: Command format is similar to existing command (1B 26). The only difference resides in the height encoding H indicates the height in number of dots instead of number of bytes (1B 26) to provide better resolution. Data are still encoded vertically.

Note : max dimensions : H max = 64, W max = 48

See (1D 22 n) “Select memory type” to save User Defined characters.

See chapter “Memory allocation” for information about potential limitations.



FS 2D=DM n0 … n4 - [MP]

1F 32 44 3D 44 4D *n0…n4*

Set parameters Data matrix ECC200

Synopsis: Set parameters for Bar Code Data matrix.

ASCII	GS	2	*D*	=	*D*	*M*	*n0*	*n1*	*n0*	*n0*
Hexadecimal	**1F**	**32**	**44**	**3D**	**44**	**4D**	**n0**	**n1**	**n0**	**n0**
Decimal	29	119	*68*	*61*	*68*	*77*	*n0*	*n1*	*n0*	*n0*

Operand:

n0	= Save parameters to memory (0x00= no saved RAM only, 0x01=saved NVM)
n1	= Select Type Data Matrix Mode (Standard=0, GS1=1, HIBC=2).
n2	= Set minimum size of matrix [0x01; 0x1E] else 0x00=automatic size.
n3	= Forced Matrix. (0x00 = Square/Rectangular matrix, 0x01= Square only).
n4	= Pixel X and Y size (X=Y = 1 to 4) * (thickness = n ; see code 1F 77 n)

Range decimal

0 ≤ n0 ≤ 1

0 ≤ n1 ≤ 2

0 ≤ n2 ≤ 30

0 ≤ n3 ≤ 1

1 ≤ n4 ≤ 4

Default in NVM:

n0 =	*N/A*
n1 =	*00*
n2 =	*00*
n3 =	*00*
n4 =	*01*

Description: Select parameters for bar code Data Matrix.

Select saving parameters in Volatile memory (RAM) or in Non-volatile memory.

Pixel size configuration with command select bar code width.

Note : Install Free External Module ‘Bar code 2D” contact your provider.

See tables below.

Operand *n1* (decimal value)	**Description**
0	Data matrix standard.
1	Data matrix input data specific standard GS1 format.
2	Data matrix input data specific standard HIBC format.

Operand *n2* (decimal value)			Maximum capacity		
n2	**Symbol size**	**Symbol type**	**Numeric**	**Alphanumeric**	**Bytes**
0	Automatic	N/A	N/A	N/A	N/A
1	10x10	Square	6	3	1
2	12x12	Square	10	6	3
3	14x14	Square	16	10	6
4	16x16	Square	24	16	10
5	18x18	Square	36	25	16
6	20x20	Square	44	31	20
7	22x22	Square	60	43	28
8	24x24	Square	72	52	34
9	26x26	Square	88	64	42
10	32x32	Square	124	91	60
11	36x36	Square	172	127	84
12	40x40	Square	228	169	112
13	44x44	Square	288	214	142
14	48x48	Square	348	259	172
15	52x52	Square	408	304	202
16	64x64	Square	560	418	277
17	72x72	Square	736	550	365
18	80x80	Square	912	682	453
19	88x88	Square	1152	862	573
20	96x96	Square	1392	1042	693
21	104x104	Square	1632	1222	813
22	120x120	Square	2100	1573	1047
23	132x132	Square	2608	1954	1301
24	144x144	Square	3116	2335	1555
25	8x18	Rectangular	10	6	3
26	8x32	Rectangular	20	13	8
27	12x26	Rectangular	32	22	14
28	12x36	Rectangular	44	31	20
29	16x36	Rectangular	64	46	30
30	16x48	Rectangular	98	72	47

Operand *n3* (decimal value)	Description
0	Symbol square and rectangular in automatic mode (n2=0)
1	Symbol Square only in automatic mode (n2=0)

Operand *n4* (decimal value)	Pixel size (mm)
1	0.125
2	0.250
3	0.375
4	0.500

FS 2D=QR n0 … n4 - [MP]

1F 32 44 3D 51 52 *n0…n4*

Set parameters QR Code

Synopsis: Set parameters for Bar Code QR Code.

ASCII	GS	2	*D*	=	*Q*	*R*	*n0*	*n1*	*n0*	*n0*
Hexadecimal	**1F**	**32**	**44**	**3D**	**51**	**52**	**n0**	**n1**	**n0**	**n0**
Decimal	29	119	*68*	*61*	*81*	*82*	*n0*	*n1*	*n0*	*n0*

Operand:

n0	= Save parameters to memory (0x00= no saved RAM only, 0x01=saved NVM).
n1	= Select Type Data Matrix Mode (Standard=0, GS1=1, HIBC=2).
n2	= Set Error correction level (L, M, Q, and H).
n3	= Forced Matrix size. (0x00 = automatic else [1; 40].)
n4	= Pixel X and Y size (X=Y = 1 to 4) * (thickness = n ; see code 1F 77 n)

Range decimal

0 ≤ n0 ≤ 1

0 ≤ n1 ≤ 2

1 ≤ n2 ≤4

0 ≤ n3 ≤ 40

1 ≤ n4 ≤ 4

Default NVM:

n0 =	*N/A*
n1 =	*00*
n2 =	*00*
n3 =	*00*
n4 =	*01*

Description: Select parameters for bar code QR Code.

Select saving parameters Volatile Memory (RAM) or in Non-volatile Memory.

Pixel size configuration with command select bar code width.

Note : Install Free External Module ‘Bar code 2D” contact your provider.

See tables below.

Operand *n1* decimal value	Description
0	QR Code standard.
1 (*)	QR Code input data specific standard GS1 format.
2 (*)	QR Code input data specific standard HIBC format.

(*)TBC.

Operand *n2* (decimal value)	ECC Level	Error correction capacity	Recovery capacity
1	L	Approx. 20% of symbol	Approx. 7%
2	M	Approx. 37% of symbol	Approx. 15%
3	Q	Approx. 55% of symbol	Approx. 25%
4	H	Approx. 65% of symbol	Approx. 30%

Operand *n3* (decimal value)			
n3	**Symbol size**	**n3**	**Symbol size**
0	Automatic	25	117x117
1	21x21	26	121x121
2	25x25	27	125x125
3	29x29	28	129x129
4	33x33	29	133x133
5	37x37	30	137x137
6	41x41	31	141x141
7	45x45	32	145x145
8	49x49	33	149x149
9	53x53	34	153x153
10	57x57	35	157x157
11	61x61	36	161x161
12	65x65	37	165x165
13	69x69	38	169x169
14	73x73	39	173x173
15	77x77	40	177x177
16	81x81		
17	85x85		
18	89x89		
19	93x93		
20	97x97		
21	101x101		
22	105x105		
23	109x109		
24	113x113		

Operand *n4* (decimal value)	Pixel size (mm)
1	0.125
2	0.250
3	0.375
4	0.500

US « BMP File » - [MP]
1F 42 4D …
Print BMP Graphics (normal)

Synopsis: Print bitmap monochrome file.

ASCII	US	“BMP file”
Hexadecimal	**1F**	**“BMP file"**
Decimal	31	“BMP file”

Description: The printer decodes the BMP file header and will save the image data after checking important parameters, such as: Width, Height, and Number of colors (only monochrome images are accepted).
Header definition see below.

Notes: BMP file images that are not monochrome are ignored

HEADER FILE n1…nX = 10 Data bytes

Value of n:

This block of bytes is at the start of the file and is used to identify the file. A typical application reads this block first to ensure that the file is actually a BMP file and that it is not damaged. The first two bytes of the BMP file format are the character 'B' then the character 'M' in 1-byte ascii encoding. All of the integer values are stored in little-endian format (i.e. least-significant byte first).

Offset #	Size	Purpose
0000h	2 bytes	The magic number used to identify the BMP file: 0x42 0x4D (Hex code points for B and M). The following entries are possible: BM - Windows 3.1x, 95, NT, ... etc
0002h	4 bytes	The size of the BMP file in bytes.
0006h	2 bytes	Reserved; actual value depends on the application that creates the image (0x00, 0x00)
0008h	2 bytes	Reserved; actual value depends on the application that creates the image (not considered by axiohm) (0x00, 0x00)
000Ah	4 bytes	The offset, i.e. starting address, of the byte where the bitmap data can be found.

DIB HEADER n1…nX = 40 Data bytes

Value of n:

Only common format is the V3 header will be supported

40	Windows V3	BITMAPINFOHEADER	all Windows versions since Windows 3.0

Offset #	Size	Purpose
Eh	4	The size of this header (40 bytes) (0x28, 0x00, 0x00, 0x00)
12h	4	The bitmap width in pixels (signed integer).
16h	4	The bitmap height in pixels (signed integer).
1Ah	2	The number of color planes being used. (0x01, 0x00) not used
1Ch	2	The number of bits per pixel, which is the color depth of the image. (Values 4, 8, 16, 24 and 32 not supported). (0x01, 0x00), Pixel white is fixed by a bit to 0, and a pixel black is fixed by a bit at 1
1Eh	4	No compression method implemented (0x00, 0x00, 0x00, 0x00)
22h	4	The image size. This is the size of the raw bitmap data (see below), and should not be confused with the file size.
26h	4	The horizontal resolution of the image. (pixel per meter, signed integer)
2Ah	4	The vertical resolution of the image. (pixel per meter, signed integer)
2Eh	4	The number of colors in the color palette, or 0 to default to 2n. (0x02, 0x00, 0x00, 0x00)

32h	4	The number of important colors used or 0 when every color is important; generally ignored. (0x00, 0x00, 0x00, 0x00)
36h	……	Start of Bitmap Data (warning Set the sens of image in the printable sens,(first line received = first line printed)

US F n - [MP]
1F 46 n
Select Font User

Synopsis: Select font type.

ASCII	US	F	*n*
Hexadecimal	**1F**	**46**	**n**
Decimal	31	70	*n*

Operand:
n = font Selection
0 16 x 24 Font A (standard pitch)
1 12 x 24 Font B (compressed pitch)
2 16 x 24 Font C (large pitch = standard pitch)

Default: 0

Limit
Dec: $0 \leq n \leq 2$
Hex: $00 \leq n \leq 02$

Description:
Note : This command will overwrite the previous font selection made by the (ESC!) command.

US V – [BP][MP]
1F 56
Send Printer Software Version

Synopsis: Send printer software version.

ASCII	US	V
Hexadecimal	**1F**	**56**
Decimal	31	86

Return : 8 bytes ASCII

Description: The printer returns 8 bytes containing the boot and Client or Main program version.
The first 4 bytes returned are an ASCII string for the boot loader version.
The second 4 bytes are an ASCII string for the main program version.

Example: The printer returns 3.842.26
This means the boot loader version is 3.84 and the main program version is 2.26

US a n – [MP]

1F 61 n

Process Ticket Number

Synopsis:	Process ticket number.		
ASCII	US	a	*n*
Hexadecimal	**1F**	**61**	**n**
Decimal	31	97	*n*

Value of:

n	= Select process
01	Clear Ticket Counter.
02	Increment Ticket Counter.

Description: The ticket counter is a 16-bit counter in memory that gets incremented or cleared by sending a corresponding command to the printer.

Note: Note that this command may be used to monitor actual transaction completion, as it is synchronised with cut commands.

This means that if this command is sent immediately after a cut command, it won't be processed until the cut cycle is complete.

US b – [MP]

1F 62

Request Ticket Number

Synopsis:	Request ticket number.	
ASCII	US	b
Hexadecimal	**1F**	**62**
Decimal	31	98

Return 3 bytes: Command ID followed by the contents of Ticket Counter.

Byte 1	= 62h
Byte 2	= Ticket Counter (LSB).
Byte 3	= Ticket Counter (MSB).

Range :

Dec:	0 ≤ *Ticket Counter* ≤ 65535
Hex:	0000 ≤ Ticket Counter ≤ FFFF

Description: Returns the contents of 16-bit Ticket Counter. See counter Code (1F 61 ...)

US c – [MP]
1F 63
Set Cut Tag

Synopsis: Sets the cut tag to the value specified by *n.*

ASCII	US	c	*n*
Hexadecimal	**1F**	**63**	**n**
Decimal	31	99	*n*

Operand: n — Cut tag value.

Range : Dec: $0 \leq n \leq 255$
Hex: $00 \leq n \leq FF$

Description: The cut tag is a flag stored in memory, used to monitor ticket transactions completion.
Send this command prior to a cut command, and then monitor the result with command Request Cut Tag (1F 64).

US d – [MP]
1F 64
Request Cut Tag

Synopsis: Returns Cut Tag status.

ASCII	US	d
Hexadecimal	**1F**	**64**
Decimal	31	100

Returns 2 bytes: Command ID followed by Cut Tag Status
Byte 1 = 64h
Byte 2 = Cut Tag Status

Description: Once the Cut tag is set with command Set Cut Tag (1F 63 n), the Cut Tag Status returned depends on the next cut cycle:

CUT TAG STATUS	
situation	**Returned value**
Cut cycle is not complete	0
Cut cycle is complete	Value set with command 1F 63 n

US e n - [MP]
1F 65 n
Return Logo Checksum

Synopsis:	Return the checksum of a logo.		
ASCII	US	V	*n*
Hexadecimal	**1F**	**65**	**n**
Decimal	31	101	*n*
Operand:	n	= Selected logo	
Limit :	Dec:	0 ≤ n ≤ 255	
	Hex:	0 ≤ n ≤ FF	
Return :	4	Bytes :	
Format	Byte 1	= 65 (Hex) = Command ID	
	Byte 2	= 01 (Hex) = Logo present	= 00 (Hex) = Logo absent
	Byte 3	= Checksum (LSB)	= 00 (Hex)
	Byte 4	= Checksum (MSB)	= 00 (Hex)

Description: Returns the checksum of a logo downloaded in flash memory (see command 1D 2A…)
Reply 4 bytes [Command ID + Flag + checksum of the logo] specified by n.
Checksum is two's complement of sum of **all** bytes in the download sequence.

Example: Checksum = **-** (0x1D + 0x2A + …) For the "Define Downloaded Bit Image" command.

US i n - [MP]
1F 69 n
Select Active User Defined Character

Synopsis:	Select active user defined character		
ASCII	US	i	n
Hexadecimal	**1F**	**69**	**n**
Decimal	31	105	n
Operand n:	n	= Select active User-font	
Default:	0		
Limits:	Dec:	0 ≤ n ≤ 255	
	Hex:	0 ≤ n ≤ FF	

Description: Selects the active user defined font used by commands 1B 26, 1F 26, 1B 25, 1B 3A, 1B 3F, 1F 6B.

Note : Setting remains unchanged until printer reboots, or command 1B 40 resets active user defined font to default.

US j - [MP]
1F 6A
Upload Logo

Synopsis:	Upload logo in Microsoft BMP format.	
ASCII	US	j
Hexadecimal	**1F**	**6A**
Decimal	31	106

Description: Upload current Logo in BMP format.
If current logo doesn't exist, the printer returns 3 byte string 6A 00 00
If current logo exists, the printer returns the byte 6A, followed by the logo description in Microsoft BMP format.

Note : Microsoft BMP bitmap file format.
See Also command "Select Current Logo" (1D 23) to change logo selection.

US k - [MP]
1F 6B
Upload Font

Synopsis:	Upload font.	
ASCII	US	k
Hexadecimal	**1F**	**6B**
Decimal	31	107

Description: Upload current Font/codepage in Easy-Font DAT format.
All printer fonts are accessible: Resident, user-defined, Easy font.

Note : Double byte fonts are not supported, for now at least.

US t - [MP]
1F 74
Print Test Form

Synopsis:	Print test form.	
ASCII	US	t
Hexadecimal	**1F**	**74**
Decimal	31	116

Description: Prints the current configuration settings on the receipt.

Note : During the self test, the printer is offline.
See also command (1F 0A 74 3D 44 reply on Com port selected).

US v n - [MP]
1F 76 n
Buffered Status Transmission

Synopsis: Buffered status transmission.

ASCII	US	v	*n*
Hexadecimal	**1F**	**76**	**n**
Decimal	31	118	*n*

Operand:
- n = Reply status select
- 1 = Printer Status.
- 2 = Error Status.
- 3 = Sensor Status.
- 4 = Sensor Status n°2.
- 5 = PrintHead Status
- 7 = PrintHead Status

Limit
Dec: 0 ≤ n ≤ 5 or n= 7
Hex: 00 ≤ n ≤ 05 or n = 07

Return : n Byte(s) See Table below.

Description: Returns the selected status when this command is processed as normal printer data.

Notes:

- The printer reset bit will be zero after the reset condition has been reported to the host for the first time.
- The packet frame status bit indicates whether a packet sequence (i.e. STX data ETX checksum) was in error.
- A TOF failure is indicated when a black mark is not detected after feeding the paper more than the maximum distance specified.
- A packet error is indicated when a packet sequence (i.e. STX data ETX checksum) is in error or a packet larger than the input buffer is received.
- The third and fourth status bytes return the raw switch or sensor status. Depending on the printer configuration, some of these switches or sensors will be used to drive printer options and are not available for external use.

"US v" RETURNED STATUS DEFINITION
***n* = 1: PRINTER STATUS**

Bit(1)	Function	Value	
		0	1
0	Paper Status	Paper	No paper
	(3) Presenter output detector paper status	Present	Out
1	(3) Presenter input detector paper status	Present	Out
2	Packet Frame status	OK	Failure
3	Printer paper detector paper status	Present	Out
4	Fixed	Always 0	-
5	Packet Checksum status	OK	Failure
6	Printer reset (2)	Reported	Reset
7	Fixed	Always 0	-

(1) Unused, reserved or undefined bit(s) set to 0.
(2) This bit is cleared after read, reported (Clear also USM power fail status).

"US v" RETURNED STATUS DEFINITION *n* = 2: ERROR STATUS			
		Value	
Bit(1)	Function	0	1
0	Printer error status	OK	Failure(2)
1	(4)Paper Jam status	OK	Failure
	(3)Presenter error status	OK	Failure
2	Packet error	OK	Failure
3	Printer door Status	Closed	Open
4	Fixed	Always 0	-
5	TOF detect status	OK	Failure
6			
	(4)Ejector sensor status	OK	Failure
7	Fixed	Always 0	-

(1) Unused, reserved or undefined bit(s) set to 0.
(2) Failure = All printer errors, except allocation error (warning Interpretation).

"US v" RETURNED STATUS DEFINITION *n* = 3: SENSOR STATUS			
		Value	
Bit(1)	Function	0	1
0	Printer door switch	Closed/Low	Open/High
1	Reserved	-	-
2	Paper low sensor	Low	High
3	undefined	-	-
4	Fixed	Always 0	-
5	Reserved	-	-
6	Printer paper sensor	Paper/Low	High
7	Fixed	Always 0	-

(1) Unused, reserved or undefined bit(s) set to 0.

"US v" RETURNED STATUS DEFINITION *n* = 4: SENSOR STATUS			
		Value	
Bit(1)	Function	0	1
0	Cutter position switch	Closed	Open
1	TOF sensor	Low	High
2	Reserved	-	-
3	Reserved	-	-
4	Fixed	Always 0	-
5	undefined		
6	undefined		
7	Fixed	Always 0	-

(1) Unused, reserved or undefined bit(s) set to 0.

"US v" RETURNED STATUS DEFINITION *n* = 5: PRINTHEAD STATUS *Two bytes are returned.*			
1st byte **Bit**	**Function**	**Value** **0**	**1**
0	Status for dots 000-063	OK	Damaged
1	Status for dots 064-127	OK	Damaged
2	Status for dots 128-191	OK	Damaged
3	Status for dots 192-255	OK	Damaged
4	Status for dots 256-319	OK	Damaged
5	Status for dots 320-383	OK	Damaged
6	Status for dots 384-447	OK	Damaged
7	Status for dots 448-511	OK	Damaged

2nd byte **Bit**	**Function**	**Value** **0**	**1**
0	Status for dots 512-575	OK	Damaged
1	Status for dots 576-639	OK	Damaged
2 to 7	Unused	Fixed to zero	

"US v" RETURNED STATUS DEFINITION *n* = 7: PRINTHEAD STATUS *80 bytes are returned.*			
1st byte **Bit**	**Function**	**Value** **0**	**1**
0	Status for dot 0	OK	Damaged
1	Status for dot 1	OK	Damaged
…	…	…	…
7	Status for dot 7	OK	Damaged

2nd byte **Bit**	**Function**	**Value** **0**	**1**
0	Status for dot 8	OK	Damaged
1	Status for dot 9	OK	Damaged
…	…	…	…
7	Status for dot 15	OK	Damaged

…

80th byt **Bit**	**Function**	**Value** **0**	**1**
0	Status for dot 632	OK	Damaged
1	Status for dot 633	OK	Damaged
…	…	…	…
7	Status for dot 639	OK	Damaged

US w n - [MP]

1F 77 n

Return Memory Allocation status

Synopsis:	Reply SRAM or flash memory allocation in user section.		
ASCII	US	v	*n*
Hexadecimal	**1F**	**77**	**n**
Decimal	31	119	*n*

Operand:	n	= Status select
Return	0	Reply the amount of SRAM memory available in for “user” section.
	1	Reply the amount of Flash memory available in user download Logo/Font section.
	2	Reply the amount of Flash memory available in user download Easy Font section.
	3	Reply the amount of Flash memory available in user data section.
Limit	Dec:	$0 \leq n \leq 3$
	Hex:	$00 \leq n \leq 03$

Description: Returns the amount of Flash memory or SRAM memory available in user sections.

Note: Returns the number of bytes available as a zero terminated ASCII string.

Each digit is coded in decimal.

For n=0, the returned value corresponds to the size of the biggest chunk of memory available, not the total amount of memory available.

US y n - [MP]

1F 79 n

Set low Resolution Raster Graphics Status

Synopsis:	Select or cancel low resolution raster graphics status.		
ASCII	US	y	*n*
Hexadecimal	**1F**	**79**	**n**
Decimal	31	121	*n*

Operand:

n = Select resolution mode.

0 = Disabled. 8 dot/mm mode.

1 = Enabled. 4 dot/mm emulation mode.

Default: 0 (Disabled)

Limit

Dec: 0 ≤ n ≤ 1

Hex: 00 ≤ n ≤ 01

Description: Returns the selected status when this command is processed as normal printer data.

Note: Used in combination with command “Print Raster Graphics” (11 n1…dn).

When this mode is enabled, the number of data bytes of command “Print Raster Graphics” is divided by two. Each pixel is doubled in horizontal direction, and the raster is printed twice.

This mode can be used to emulate 4 dots/mm graphics.

US z n - [MP]

1F 7A n

Return User Font Status

Synopsis:			Return user font status.
ASCII	US	z	n
Hexadecimal	1F	7A	n
Decimal	31	122	n

Operand: n = Select font status.

Limit

Dec: 0 ≤ n ≤ 255

Hex: 00 ≤ n ≤ FF

Reply : Always returns 2 Bytes : Command ID + Status of font n.

Id = Command 7A (hex)

Status = 0 if no character in this font is defined.

= 1 if at least one character in font n is defined.

Description: Returns the status of selected user font.

US ý n - [MP]
1F EC n
Presenter Low Level commands

Synopsis: Executed the low level ejector commands.

ASCII	US	ý	n	sL	sH
Hexadecimal	**1F**	**EC**	**n**	**sL**	**sH**
Decimal	31	236	*n*	*sL*	*sH*

Operand n: = Command Selection.

s: = (256*sH + sL) = Numbers of steps. (1).

Limit **Dec:** $0 \le n \le 9$ $0 \le s \le 65535$

Hex: $00 \le n \le 09$ $0000 \le s \le FFFF$

Presenter commands

Operand n	Operand s	Designation
0	0 = sL = sH	Eject ticket
1	0 = sL = sH	Retain ticket
2	0 = sL = sH	Retract ticket
3	Number of steps(1)	Forward *s* steps
4	Number of steps(1)	Backward *s* steps
5	0 = sL = sH	Print Presenter speed table
6	s= 0	Command Bezel Red LED off
6	s= 1	Command Bezel Red LED on
6	s>1 s= Blink Period in ms	Command Bezel Red LED blink
7	s= 0	Command Bezel Green LED off
7	s= 1	Command Bezel Green LED on
7	s>1 s= Blink Period in ms	Command Bezel Green LED blink
8	(1) sL= Led to synchronize (2) sH= type of synchronize	Synchronize Bezel Red with another led
9	(1) sL= Led to synchronize (2) sH= type of synchronize	Synchronize Bezel Green with another led

Description: This command will execute some presenter commands.

Notes: For n= 8 or 9: First select type of synchronize with master led and send command to master led.

(1) Value of sL	Identify master Led	(2) Value of sH	Synchronize Phase
0	On board (red led)	0	No
1	Bezel red Led	1	Opposition
2	Bezel green Led	2	Same

13 Presenter errors Cases:

Presenter Error detection	Error	Action
Command Cut with no paper on sensor input or output ejector. (1)	Cut is aborted, Ejector Failure is set. BEZEL Red Led blinking	Remove all paper of the printer (printer status is paper empty). And reloaded paper.
After eject ticket command (retracting or ejecting) paper is present on input or output sensor.	Ejector Failure is set. BEZEL Red Led blinking.	Remove paper front all presenter sensors.

End Paper Error detection TBC	Error	Action
Ticket is minimal <65.0mm. (1) (2)	Paper is backward. Paper empty error is set. BEZEL Red Led blinking.	Remove all paper in the printer (printer status‘s paper empty). And reloaded paper.
Ticket is >65.0mm. (2)	Paper empty error is set. BEZEL Red Led blinking. Paper is presented and taken. Ticket is bad or not!?	Loaded new roll paper.
Ticket is >65.0mm. (2)	Paper empty error is set. BEZEL Red Led blinking. Paper is presented and no taken. If retracted option is set. Paper is retracted.	Loaded new roll paper.

(1) In this case, you can use “Paper Feed Button “to remove paper (Motor paper feed backward).
(2) Use real time command \x10 \x05\x02 to clear printing and receiving data buffers. You can also clear specific features with \x1B \x40 command. You can also use paper low sensor information.

14 SRAM MEMORY ALLOCATION

A pool of SRAM memory is shared by different functions, and is allocated dynamically. The size of this pool depends on the SRAM chip fitted on the board.
With a 128kbytes SRAM chip (64KWords), the pool buffer size is ~84 Kbytes (see command 1F 0A 52 3D n).

To avoid memory allocation errors and unexpected behaviour as a consequence, it is important to understand the allocation process.

The following functions use dynamically allocated memory in SRAM:

Right Side Character Spacing

A 2560 bytes buffer for right side character spacing processing is allocated if right side spacing is not equal to 0.

Character Scaling

A 7680 bytes buffer for character scaling processing is allocated if character width or height ratio defined with command (1D 21) is greater than 2.

Upside Down Printing

A buffer is allocated to process upside down printing. Its size is variable and depends on character scaling height ratio, and font height.
If this ratio equals 1 and font height equals 24, the buffer size is 3840 bytes, but it can take up to 31040 bytes in worst case.

Logo download

As soon as at least one logo is downloaded to either SRAM or FLASH memory, a 4096 bytes buffer is allocated to store information structures.
This buffer is freed:

- When processing command (1B 40), unless there is at least one logo stored in Flash memory.
- When processing command (1D 40 31) to erase user font / logos flash storage area, unless there is at least one logo stored in SRAM.

For each logo, a data buffer is allocated in SRAM. Its size corresponds to the logo bitmap size. If the logo is stored in FLASH, this buffer is freed after transfer to FLASH.
If the logo is SRAM, this buffer is freed when processing command (1B 40).

User fonts download

As soon as at least one user font is downloaded to hither SRAM or FLASH memory, a 1024 bytes buffer is allocated to store information structures.
This buffer is freed:

- When processing command (1B 40), unless there is at least one user defined character stored in Flash memory
- When processing command (1D 40 31) to erase user font / logos flash storage area, unless there is at least one user defined character stored in SRAM.

For each user font (collection of multiple characters) downloaded in either SRAM or FLASH memory, a 3584 bytes buffer is allocated to store information structures.
This buffer is freed:

- When processing command (1B 40), unless there is at least one user defined character stored in FLASH memory
- When processing command (1D 40 31) to erase user font / logos flash storage area, unless there is at least one user defined character stored in SRAM.

For each character stored in SRAM, a data buffer is allocated in SRAM.
Its size corresponds to the character bitmap size.
If the user character is stored in FLASH, this buffer is freed after transfer to FLASH.
If the user character is stored in SRAM, this buffer is freed when processing (1B 40) or (1B 3F) commands.

Page mode

The page mode print data rendering is done in a buffer stored in SRAM.
Its size is: total page width x total page height
The buffer is allocated when entering page mode. Its size may be readjusted if necessary if the total height or width is increased by command “Set print area in page mode”.
The buffer is freed when leaving page mode

Barcode printing

The barcode rendering is done in a buffer stored in SRAM. The buffer is freed once the barcode is printed. The buffer size corresponds to the barcode bitmap size, including HRI

Macro Definition

The macro is stored in a 2048 bytes buffer. It is allocated when starting macro definition. It is freed if a macro definition is empty, or if an “execute macro command” is sent while recording the macro.

Easyfont download

Single byte fonts
A 3584 bytes buffer is allocated to store information structures.

This buffer is freed when processing command (1D 40 33) to erase Easyfont storage area.

In addition, a temporary buffer is allocated when processing (1C 4C) command. It is freed at the end of the processing of this command
Its size is: 2 x character width in bytes x character height

Summary

Function Name	Persistent storage	Temporary storage
Right side spacing	2560	-
Character scaling	7680	-
Upside down printing	-	Typically 3840, up to 31040
Flash Logo download	4096	2 x LogoWidthInWords x LogoHeight
SRam Logo download	4096 + 2 x LogoWidthInWords x LogoHeight	-
Flash User char download	1024 + 3584 per font	2 x NbChars x CharWidthInWords x CharHeight
SRam User char download	1024 + 3584 per font + 2 x NbChars x CharWidthInWords x CharHeight	-
Page mode	2 x PageWidthInWords x PageHeight	-
Barcode printing	-	2 x CodeWidthInWords x CodeHeight
Macro definition	2048	-
Easyfont single	3584 per font	2 x CharWidthInWords x CharHeight

(All sizes in bytes)

15 ERROR HANDLING

The printer has different behaviour when an error condition occurs, depending on how Fault recovery mode is configured.

15.1 Automatic Fault Recovery Mode

Condition	Internal status	Restart condition
Paper out	Error	Refill paper, open/close cover
Low Paper	Warning	Change Paper Roll.
Cover open	Error	Close cover
Temperature error	Error	Wait until temperature is in valid range
Voltage error	Error	Wait until voltage is in valid range
Knife error	Error	Inspect Knife, clear jammed paper if necessary or and Push Paper Feed Button to rehinit cutter (only 2 push).
Paper Jam error	Warning	Check Exit Paper. Clean exit paper.
Ejector error	Error	N/A
TOF error	Error	N/A (Q2-2013)
SRAM alloc error	Warning	Clear allocation error, send real time Command 10 19 09.
FLASH alloc error	Warning	Clear allocation error, send real time Command 10 19 09.

When an error is detected, following actions take place:
* On USB interface all datas received on BULK OUT will continue to be stored in receive buffer until it is full. From then on, all subsequent datas will be lost.
To avoid this situation make sure to monitor status either with real time commands or USM automatic status.
* Status reported by status commands is updated within a few milliseconds.

Once all errors conditions are cleared, following actions take place:
* On USB interface all new datas received on BULK OUT are stored normally in receive buffer.
* Batch commands processing restarts from where it stopped in the receive buffer, although 1 or 2 lines of text that were leftover in print buffer may be lost.
* Status reported by status commands is updated within a few milliseconds

15.2 Host Controlled Fault Recovery Mode

Condition	Internal status	Restart condition
Paper out	Error	Refill paper, open/close cover and send real time command (10 05 02)
Paper low	Warning	TBC
Cover open	Error	Close cover and send real time command (10 05 02)
Temperature error	Error	Wait until temperature is in valid range and send real time command (10 05 02)
Voltage error	Error	Wait until voltage is in valid range and send real time command (10 05 02)
Knife error	Error	Inspect Knife, clear jammed paper if necessary or and Push Paper Feed Button to rehinit cutter (only 2 push). Send real time command (10 05 02)
Paper Jam error	Warning	TBC
Ejector error	Error	N/A
TOF error	Error	N/A (Q2-2013)
SRAM alloc error	Warning	Clear allocation error; send real time command 10 19 09. And send real time command (10 05 02).
FLASH alloc error	Warning	Clear allocation error; send real time command 10 19 09. And send real time command (10 05 02).

When an error is detected, following actions take place:
* On USB interface all datas received on BULK OUT will continue to be stored in receive buffer until it is full. From then on, all subsequent datas will be lost.
  To avoid this situation make sure to monitor status either with real time commands or USM automatic status
* Batch commands processing is blocked immediately. Real time commands processing remains active
* Status reported by status commands is updated within a few milliseconds

Once all errors conditions are cleared, following actions take place:
* On USB interface all new datas received on BULK OUT are stored normally in receive buffer.
* After processing real time command (10 05 02), receive and print buffers are cleared
* Batch commands processing restarts.
* Status reported by status commands is updated within a few milliseconds

16 TROUBLESHOOTING

Axiohm printers are simple and generally trouble-free, but from time to time minor problems may occur. Follow these procedures to determine the cause and resolution of any problems the printer may be having. If the procedures in this section do not correct the problem, contact a service representative.

16.1 LED

Problem	Possible Causes	What to Do
LED, slow continuous flashing (1 flash / sec or more).	Out of paper.	Put in a new paper.
	Paper low detection.	Put in a new paper roll.
	Cover off.	Put the cover on.
	Print head is too hot.	Waiting until the print head has returned to its operating temperature range.
	Voltages are out of range.	(1) Waiting until voltage returned to its operating voltage range. (Few seconds) (2)Turn the printer off (*unplug*). Change power supply if possible or Contact your authorized service representative.
	Temperature are out of range.	(1) Waiting until Temperature returned to its operating temperrature range. (Few minutes if too Heat) (2) if too cold printer start automatic the preheating mode, waiting few minutes. If you don't want waiting. Set preheating mode with the command.
	Knife Error	(1) Turn Off printer. (2) Open the receipt cover, inspect the knife, and clear any jammed paper. (3) Turn On printer. ------- (1) Open the receipt cover, inspect the knife, and clear any jammed paper. (2) - Push Paper Feed button to rehinit cutter and clear error. - Unload paper (create paper empty) and reload the Paper. - Reset the printer.
	Paper Jam Error	(1) Waiting until paper returned to good position. (Few seconds) (2)Turn the printer off (*unplug*). (3) Open the receipt cover, inspect the Knife out and Paper Jam System, and clear any jammed paper. (4) Turn On printer.
	Ejector Error	N/A
	Top Of Form error	N/A (Q2 -2013).
	Memory allocation error.	(1) Clear error with real time command (10 19 09). (2) Or Reset the printer.
Flashing LED in various combinations. <u>Examples</u>: Double LED Flash Triple LED Flash	Hardware problems Peripheral Test Failure. ...	(1) Reset the printer. (2) Turn the printer off (*unplug*). These indicate serious problems. Contact your authorized service representative.
Fast continuous flashing of LED:	You are enter to Boot program (Maintenance Mode)	Reset the printer
	Main Program CRC Test Failure.	Download Boot and Main Program.

16.2 Printing Problems

Problem	Possible Causes	What to Do
Colored stripe on the receipt.	Paper is low.	Change the paper roll.
Receipt does not come out all the way.	Paper is jammed.	Open the receipt cover, inspect the knife, and clear any jammed paper.
Printer starts to print, but stops while the receipt is being printed.	Paper is jammed.	Open the receipt cover, inspect the knife, and clear any jammed paper.
Receipt is not cut.	Paper is jammed.	Open the receipt cover, inspect the knife, and clear any jammed paper.
	The printer is not configured for a knife.	Contact your authorized service representative.
Print is light or spotty.	Test with another font.	Test same ticket in bold print.
	Paper roll loaded incorrectly.	Check that the paper is loaded properly.
	Thermal printhead is dirty.	Use recommended thermal receipt paper.
	Variations in paper.	Increase print density in “Set Hardware Options” of printer Configuration Menu as needed.
Vertical column of print is missing.	This indicates a serious problem with the printer electronics.	Contact your authorized service representative.
One side of receipt is missing.	This indicates a serious problem with the printer electronics.	Contact your authorized service representative.

16.3 Printer Does Not Function

Problem	Possible Causes	What to Do
Printer does not function when turned on.	Printer not plugged in.	Check that printer cables are properly connected on both ends.
		Check that the host or power supply is getting power.

17 GLOSSARY – ABBREVIATION

- NVM: Non-Volatile Memorie (type EPROM).
- VM: Volatile Memorie (Type RAM)
- ASB: Automatic Status Back.
- USM: Unsolicited Status Mode.
- BP: Boot Program.
- MP: Main Program.
- DBG: Debug Command.
- LSB: Least significant Bit.
- MSB: Most Significant Bit.
- N/A: Not Applicable.
- A/D: Analog to Digital.
- MBC2: Module Bar Code 2D.
- HIBC: Health Industry Business Communications Council.